NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 4, NUMBER 25 JUNE 22, 1987

▶ *MARKETING MANEUVERS*

Timeplex set for major product push

New T-1 mux, NetView rival due this week.

BY PAUL KORZENIOWSKI
Senior Editor

WOODCLIFF LAKE, N.J. — As part of a multitiered announcement slated for this week, Timeplex, Inc. is expected to introduce its most sophisticated T-1 multiplexer and an integrated network management package that may go head-to-head with IBM's NetView.

The company is also set to outline its long-term networking strategy and announce that a major computer vendor will support Timeplex's new net management system.

Timeplex has scheduled a three-day public relations extravaganza that will include a nine-city videoconference during which users, members of the press and industry and financial analysts will be

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▶ *IBM*

Big Blue product barrage builds VTAM, SNA muscle

Enhanced NetView, 9370 net software in product blitz.

BY PAUL KORZENIOWSKI
Senior Editor

NEW YORK — In what the company referred to as "the largest communications software announcement in its history," IBM unveiled some 50 products last week that fill key holes in its product line and pump peer-to-peer networking flexibility into its Systems Network Architecture's hierarchical structure.

See pages 3 and 7 for more on IBM's announcements.

Among the products were new releases of VTAM, IBM's strategic tele-

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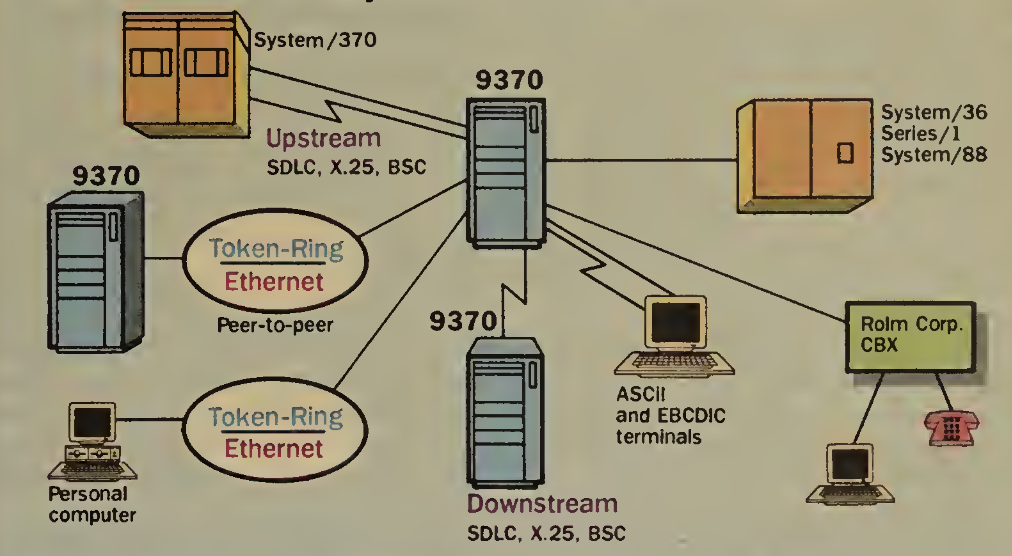
Network options for the IBM 9370



APPC = Advanced Program-to-Program Communications
BSC = Binary Synchronous Communications
SDLC = Synchronous Data Link Control
TCP/IP = Transmission Control Protocol/Internet Protocol

New software support enables IBM 9370 APPC applications to communicate with APPC applications on other systems, incuding the System/36 and Series/1. Other connectivity enhancements included X.25 support, TCP/IP compatibility and channel-to-channel host attachments. (See story page 3.)

SOURCE: IBM, RYE BROOK, N.Y.

SERVICE FOCUS

Regulatory storm jolts VANs

BY BYRON BELITSOS
Special to Network World

Until recently, networking pundits predicted high growth in the use of public packet-switching services, also known as value-added networks (VAN).

Now, growth that has been slower than expected, coupled with a stormy regulatory climate, make the VANs' future uncertain.

The first lightning bolt came from the Department of Justice, which recently recommended lifting its Modified Final Judgment restrictions prohibiting Bell operating company entry into interexchange carrier services and value-added information services. Currently, the BOCs are allowed to provide packet-

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NETWORK LINE

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▶ *LOCAL NETWORKING*

Sytek readies new baseband network

BY PAULA MUSICH
Senior Editor

NEW YORK — In a dramatic departure from its broadband networking roots, Sytek, Inc. will soon unveil a baseband Ethernet-based product line, *Network World* has learned.

Sytek will announce the LocalNet 4000 Ethernet-based line of networking products for both thick and thin Ethernet some time late this summer.

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▶ *INTERNETWORKING*

Standards jumble haunts EDI users

Third in a three-part series.

BY PAM POWERS
Senior Editor

Although some have profited from them, users of electronic data interchange (EDI) networks have created their own bedlam with the development of numerous industry-specific standards that they are now trying to piece together into one coherent standard called X12.

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PACIFIC BELL

BOC halts disputed program

Training plan was criticized by PUC.

BY MARY PETROSKY
West Coast Correspondent

SAN FRANCISCO — Pacific Bell suspended a controversial management development program last week after a division of the California Public Utilities Commission (PUC) recommended reducing the phone company's rates by $25 million to recover ratepayer money spent on the program.

The recommendation followed the issuance of a report June 10 by the Public Staff Division (PSD) of the California PUC after it found that Pacific Bell's so-called Leadership Development program was flawed and did not merit the financial support of ratepayers.

The program was intended to help Pacific Bell become more competitive by improving management techniques and cooperation among different units. The company has been running the program — 10 two-day sessions teaching things like conducting meetings and defining task cycles — since 1983.

Based on questionnaires, observation of training sessions, personal interviews with Pacific Bell employees and other methods, the PSD, which was chartered to look after the interests of ratepayers, concluded that Pacific Bell's Leadership Development program was causing more harm than good.

PSD Project Manager Bill Thompson said ratepayers are footing part of the bill for the Leadership Development program, and the bottom line is "they're not getting the value for their dollar."

The report maintains that, "The negative influences from the Leadership Development seminars and the manner in which senior man-

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SIMULTANEOUS SESSIONS

Bridge board provides users multinet access

BY MARY PETROSKY
West Coast Correspondent

MOUNTAIN VIEW, Calif. — After a year of development, Bridge Communications, Inc. is expected to unveil a product tomorrow that will enable IBM Personal Computers to access both personal computer and terminal-to-host broadband networks simultaneously.

The Personal Communications Server/1 (PCS/1) interface board can be used to connect to standard coaxial cable, thin coaxial or fiber-optic Ethernet networks, and Bridge's 5M bit/sec broadband net.

The ability to support multiple, simultaneous sessions will enable users to switch back and forth between environments. In addition, the PCS/1 is fully compatible with Microsoft Windows, allowing users to run communications sessions and applications in separate windows and to move information from one window to another on the PCS/1 screen.

Bridge developed the PCS/1 for companies with large networks, according to William Carrico, presi-

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VIRTUAL NETWORKING

Echlin finds talk is cheap with UNIS

BY JIM BROWN
New Products Editor

BRANFORD, Conn. — Trying to get the functionality of a virtual net without relying on a carrier, an auto parts maker here is beta testing a product that makes the public-switched telephone network act like a private-line network.

For the last two months, Echlin, Inc. has been using Somerville, Mass.-based Telelogic, Inc.'s Universal Network Interface System (UNIS) to provide a virtual private line between its headquarters here and the company's warehouse in Cheshire, Conn., 50 miles away.

Based on early test results, Brian Wananaker, corporate manager of telecommunications, said he is leaning toward expanding his use of UNIS to reduce the number of private lines his company needs to link remote offices, while totally replacing private lines between other offices.

Wananaker is also considering using UNIS to allow offices that do not have the voice traffic necessary to justify the cost of a private line to appear as though they are linked to the private-line network.

UNIS enables customers to maintain corporate telephone numbering plans without using dedicated

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UNGERMANN-BASS

PS/2 net card bows

BY PAULA MUSICH
Senior Editor

SANTA CLARA, Calif. — Ungermann-Bass, Inc. last week reorganized its sales organizations and announced what it called the first Ethernet adapter for IBM's new Personal System/2.

According to Ralph Ungermann, president and chief executive officer, the company has been reorganized to create three geographic sales and support business units and three product business units.

The geographic units — North America, Europe and the Far East — will market and service products from Ungermann-Bass and its two subsidiaries, Linkware Corp. and Industrial Networking, Inc., both of which became new business units.

Waltham, Mass.-based Linkware provides micro-to-mainframe products, and Industrial Networking, based here, makes factory networking systems.

Ungermann said there were no layoffs made in conjunction with the reorganization, although employees were shifted into the new organizations. The firm reported a profitable first quarter, and Ungermann said that the second quarter, which closes at the end of the month, should also be profitable.

The Net/One NICPS/2 Ethernet adapter, developed in conjunction with IBM, is compatible with IBM's new Micro Channel bus architecture used in the Personal System/2 Models 50, 60 and 80. The adapter supports both Ungermann-Bass' Net/One PC networking software and Novell's Advanced NetWare.

The network interface controller, which includes 16K bytes of random-access memory, is a nonintelligent card that uses an application-specific integrated circuit developed by Ungermann-Bass. The application-specific integrated circuit chip, using very large scale integration technology, incorporates some 60 discrete functions. This enabled Ungermann-Bass to reduce the size of the adapter, allowing it to fit in the shorter and narrower shape of the Personal System/2.

The new chip uses the same shared memory architecture used in other Ungermann-Bass adapters, and it includes a 32K-byte shared memory window. Shared memory is a method of transferring data from the host processor to the adapter.

The adapter is priced at $495 and is available now. Ungermann-Bass also plans to develop adapters supporting other access schemes, such as an 802.5 Token-Ring adapter. "You can expect to see us continue development of the PS/2 product line," Ungermann said.

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▶ *DEPARTMENTAL PROCESSORS*

IBM 9370 tools offer users new net options

BY PAUL KORZENIOWSKI
Senior Editor

NEW YORK — As expected, IBM last week added a lot of meat to the bare bones communications capabilities of its strategic 9370 departmental processor ("IBM details planned network offerings," *NW*, May 4).

Among the offerings unveiled during IBM's mammoth product announcement here were a version of VTAM designed specifically for the 9370 and software to attach the processor directly to the IBM Token-Ring Network. IBM also enhanced the 9370's LU 6.2 support, brought the processor under the NetView umbrella and introduced software that allows 9370s to communicate over an X.25 net.

VTAM 3.1.2 is designed to provide 9370 processors running IBM's VM or VSE operating systems with communications capabilities equal to processors running the MVS operating system. Previously, VM or VSE versions of VTAM were not as robust as versions running under MVS, industry analysts said.

The new communications software could enable users to cut their costs by eliminating leased lines. Customers will also be able to mix communications from 9370s, IBM 3174 cluster controllers and other devices on a single Network Control Program-controlled multidrop line. Previously, each device required a leased line.

Also, customers can work with switched, rather than leased, lines to connect a remote 9370 to a central host processor. "Customers with batch jobs can transmit information when line costs are cheapest," said L. David Passmore, principal at Network Strategies, Inc., a Fairfax, Va., consulting firm.

VTAM 3.1.2 will be available by the second quarter of next year. Prices for the initial license range from $963 to $3,525, and the monthly licensing fee ranges from $321 to $1,175.

IBM's new VTAM Token-Ring Local Area Network Communications Adapter enables a 9370 to connect directly to a Token-Ring Network, allowing a 9370 to communicate with another 9370 or with devices on the network.

VTAM maps a local-area network station to either a leased Synchronous Data Link Control connection for processor-to-processor communications or to a switched line for a slave-to-master connection. Network alerts can be passed from the Token-Ring Subsystem Controller to NetView.

Applications running on a 9370 establish LU 6.2 peer-to-peer connections through IBM's Application Program Interface to Transparent Services Access Facility (TSAF). The API enables a 9370 to conduct peer-to-peer sessions with devices such as the Personal Computer, System/36 and Series/1. TSAF has been enhanced to run over an SDLC connection. Previously, the software worked with Ethernet, Token-Ring Network and Binary Synchronous Communications connections.

IBM announced two methods of connecting a 9370 to an X.25 network. An X.25 Communications Adapter supports SNA-to-SNA communications over an X.25 network. The 9370 will also be able to support X.25 communications using the Transmission Control Protocol/Internet Protocol. TCP/IP protocols were developed for the Department of Defense, and IBM said it plans to have its TCP/IP implementation certified by the Defense Department. The TCP/IP capabilities will be available in

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▶ *FTS 2000 CONTRACT*

GSA under fire after EDS backs off

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — Electronic Data Systems Corp.'s (EDS) withdrawal from bidding on the Federal Telecommunications System (FTS) 2000 contract has brought into question once more the General Services Administration's handling of the giant networking project.

Two weeks ago, Dallas-based EDS said it was pulling out of the competition for the $4.5 billion contract due to "the prospect of further disruptions in the contract award process caused by disputes, controversy and litigation; the unpredictable telecommunications environment; and uncertainty in the timing and award of the contract."

Other participants in the FTS 2000 competition, members of Congress and the General Accounting Office (GAO) have also raised questions about GSA actions regarding the networking contract. The GSA is responsible for reviewing the bids, awarding the contract and overseeing the FTS 2000 program. Critics charge the GSA with failing to provide bidders with information needed to develop proposals and with making changes in the request for proposal.

U.S. Congressman Carl Perkins (D-Ky.) has asked the GAO, which is an arm of Congress, to investigate the GSA's handling of the FTS contract. GAO administrators have been meeting with GSA officials to review FTS procurement methods.

In a May report, the GAO recommended that the FTS 2000 procurement be halted. The GAO concluded that the methods used by the GSA to establish the FTS 2000 framework were seriously flawed and needed to be reevaluated. The GSA said it will respond to the criticism in writing in July.

"No matter who wins the contract, it's almost certain to be contested in court," said industry analyst Frank Dzubeck, president of Communications Network Architects in Washington, D.C. "EDS saw a lot of uncertainty and decided the risks were too high."

According to industry analysts, EDS spent an estimated $10 million in preparing its bid. The remaining bidders are expected to spend between $11 million and $20 million on their bids.

US Sprint Communications Co., which teamed up with EDS five months ago as subcontractor, is considering its options in the wake of EDS's withdrawal, according to company spokesman David Niklaus. US Sprint must decide before the July 30 bid deadline whether it will bid on FTS as a prime contractor or join another team.

EDS's departure from the fray leaves only two bidding teams, headed by prime contractors AT&T and Martin Marietta Corp. Martin Marietta spokesman David Wonderling said, "It's unfortunate EDS pulled out, but we understand their decision."

In March, the GSA issued an amendment to the RFP that prohibited any bidder from including common carrier tariffed services in the contract in an effort to guarantee fixed prices for the 10-year life of the contract. AT&T strongly protested that action. As a common carrier, AT&T is required to offer all services under tariffs that are subject to changes mandated by the Federal Communications Commission. The GSA and AT&T reached a compromise that would allow AT&T to bid with tariffed services if the FCC agrees that the rates for those services will be fixed for the life of the contract. The FCC has yet to render its decision in the matter.

Soon after the GSA/AT&T agreement, EDS announced it was pulling out of the bidding.

EDS spokesman Mark Fox said, "The tariff issue was one of the disruptions in the bidding process that caused us to rethink our plans. We felt going into this project that the contract was geared toward a systems integrator providing firm fixed prices for service.

"As a systems integrator, EDS felt it had a good chance of winning," he said. "Then the GSA changed the RFP to allow tariffed services which are subject to price changes, and this tilted the project toward a carrier."

▶ *PRODUCT ENHANCEMENTS*

Big Blue upgrades NetView

Release 2 monitors PU 2.1 net devices

BY PAUL KORZENIOWSKI
Senior Editor

NEW YORK — IBM last week significantly boosted the management capabilities of NetView, its host-based network management system, and took a small step toward supplying users with expert system network management capabilities.

Introduction of NetView Release 2 is intended to enable customers to centralize management of Systems Network Architecture and non-SNA networks, as well as automate simple tasks such as restarting data lines when predefined conditions are encountered.

The expected NetView enhancements ("NetView upgrade leading IBM blitz," *NW*, June 15) included an automated console feature, the ability to manage operating system software, the ability to monitor an IBM PU 2.1 device, a second release of NetView/PC and additional vendor support for NetView/PC.

"The announcements strengthened IBM's foothold in the network management arena," noted John Pickens, senior communications architect at Communications Solutions, Inc., a San Jose, Calif., software and consulting firm.

Automated Console Operations is a set of host software enhancements and products that automate and consolidate network management functions. One component, NetView's Automated Message Table, automatically invokes network management commands based on network feedback. The new capability would, for example, automatically initiate loop-back tests whenever certain types of link problems are detected.

Users have thirsted for this type of expert system-like tool to automate such rudimentary functions, analysts said.

NetView's capabilities were expanded beyond management of communications links to operating system and subsystem software. From a single terminal, NetView operators can now control MVS/JES2, MVS/JES3, VM/SP, VM/SP HPO, VM/XA and VSE operating systems and subsystems. Previously, operators trying to identify the source of a problem had to jump from terminal to terminal to run tests and isolate the problem's source.

Frank Dzubeck, president of Communications Architects, Inc., a Washington, D.C. consulting firm, said NetView should no longer be considered a network management product. Instead, the product should be called an information

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▶ *DEPARTMENTAL NETS*

DEC offers workstation networking products

Multipurpose VAXserver 100 bows.

BY JIM BROWN
New Products Editor

MAYNARD, Mass. — Continuing a seven-month product barrage aimed at the departmental network environment, Digital Equipment Corp. last week introduced new technical workstations, unveiled a network file and compute server and doubled the number of devices supported by its Local Area VAX Cluster to 28.

The move is aimed at shoring up DEC's hold on its bread-and-butter market — technical and engineering workstations. DEC also said it is trying to position the offerings to spread into the financial industry and educational markets.

The announcements expand on DEC's Local Area VAX Cluster work group networking architecture, which is designed to make several VAX processors appear as one system. Under that concept, the new VAXserver 100 system, running the Local Area VAX Cluster software announced last November, allows a system manager to make the systems linked to it appear as one system using a single copy of the VMS operating system and a single copy of an application.

The Local Area VAX Cluster software uses lower level transport protocols than those used within DEC's DECnet, which is used to provide physical connections across a company's devices.

Chelmsford, Mass.-based Apollo Computer, Inc. is now drumming up support for a concept similar to DEC's Local Area VAX Cluster. Last February, Apollo announced a software suite, dubbed the Network Computing System, that is being designed to allow network-connected systems from multiple vendors to share data, applications and processing power. Apollo is hoping the software will be the basis for an open network computing architecture that will allow systems from multiple vendors to share processing power within a departmental network.

The VAXserver 100 system is a specially configured MicroVAX II computer designed to act as a file, application, communications and compute server in a Local Area VAX Cluster. It will also run DECnet operating software containing DECnet routing tables, which will enable Local Area VAX Cluster-attached workstations to communicate with remote DECnet devices. DECnet will also support communications between Local Area VAX Clusters.

According to David Terrie, a consultant with the Boston-based NewPort Consulting, Local Area VAX Cluster and VAXserver 100 system concepts are bringing DEC closer to the overall concept of providing true network connectivity. With true network connectivity, network applications could transparently link to whatever resources are needed to complete various tasks.

Vendors are entering a new battleground, where individual CPUs are not as important as the power of networked CPUs, Terrie noted. As applications are developed that automatically off-load processing tasks from one computer to another on the network, users will be able to transparently direct processing tasks to the computing device on the network designed to handle it, he added.

DEC and Apollo are entering that battleground with different weapons. Apollo is trying to base its system on protocols accepted as standard by other vendors, Terrie said, while DEC continues to build on its own proprietary networking architecture.

DEC's $65,000 VAXserver 100 system also includes 16M bytes of memory, a 456M-byte formatted Winchester disk drive, a 95M-byte streaming tape drive and a built-in Ethernet adapter.

The VAXserver 100 system comes with software licenses for VMS, DECnet and the Local Area VAX Cluster.

Announced along with the VAXserver 100 system were a number of new models in the VAXstation 2000 product line, including a pair of color workstations priced at $7,900 and $11,900; a desktop workstation for $4,600; a 50% reduction in the price of existing VAXstation 2000 workstations to $5,400; and a 159M-byte Winchester disk drive for $6,900. ◘

Timeplex set for major push

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briefed on the company's plans. Timeplex's news will come just one week after archrival Network Equipment Technologies, Inc. (NET) scored a major competitive coup by signing a joint marketing and development deal with IBM for NET's T-1 multiplexers. (See "NET seeks edge via IBM," *NW*, page 7.)

Timeplex reportedly will unveil four models of a new high-end T-1 multiplexer, the Link/100, designed to catapult the company into the technological lead in the high end of the market. "Timeplex wants to be perceived as the leading technology supplier," noted Tim Zerbiec, vice-president at Vertical Systems, Inc., a consulting firm in Dedham, Mass.

Currently, NET and Digital Communications Associates, Inc. are viewed as the leading-edge suppliers, according to Zerbiec, who added that Timeplex does not want to lose potential sales because customers do not think its products can support sophisticated nets.

The Link/100 will be able to support as many as 144 T-1 lines and 15,000 channels, well above the 96 T-1 lines and 7,400 channels supported by the most powerful multiplexers currently available. A company spokesman said the product will feature a new switching architecture that will make it easier for customers to allocate channels dynamically and to support a greater number of nonblocked channels. Timeplex's existing products do not support switching. The multiplexer will incorporate a distributed architecture so users can manage remote nodes from a central site.

Users reportedly will be able to upgrade the company's current Link/2 multiplexers to Link/100 models, according to a Timeplex spokesman. The Link family works with domestic 1.544M bit/sec as well as international 2.048M bit/sec T-1 lines.

Timeplex's multiplexers support pulse code modulation, which provides 24 64K bit/sec voice channels per 1.54M bit/sec T-1 link, and adaptive differential pulse code modulation, which divides the line into 48 64K bit/sec voice channels.

Also expected to be announced next week is Time/View, a new network management system based on a Hewlett-Packard Co. 9000 series minicomputer that can control Timeplex and other vendors' communications equipment.

The product reportedly can be used in conjunction with current Timeplex network management systems such as Link/View, which sends network management information to IBM's NetView, and Link Network Management System, which runs on an IBM Personal Computer AT and controls Timeplex's Link family of T-1 multiplexers.

The company has previously discussed its plans to release the Time/View product, which has been under development for more than two years under the name Unified Network Management Systems. Timeplex plans to publish interfaces that will enable other vendors to modify their network management products to feed information to Time/View. A Timeplex spokesman said a major computer vendor may take part in the product introduction to announce that its net management tools will work with Time/View, but he declined to name the company.

Howard Anderson, president of the Boston-based Yankee Group, said he does not think Timeplex would benefit from such an agreement. "Timeplex's customers are large IBM shops," he said. "The company should be fighting to keep those customers rather than play footsie with minicomputer vendors like DEC or Hewlett-Packard."

Delivery of the new products will begin in September. No pricing information was available. ◘

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Second-class postage paid at Framingham, MA, and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue the last two weeks in December by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-800-544-3712, within Pennsylvania 1-215-630-9500.

Non-qualified subscribers: $3.00 a copy; U.S. — $95 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

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▶ *LOCALNET EAST*

Vendors see TCP/IP as ISO standards stopgap

Weaknesses in net management cited.

BY PAULA MUSICH
Senior Editor

NEW YORK — Top networking vendors at last week's Localnet East conference here agreed that TCP/IP is useful in building multivendor networks but say it is an incomplete solution adopted by users in the era before widespread availability of products based on ISO standards.

Interviewed by *Network World*, managers and executives from Excelan, Inc., Sytek, Inc., Novell, Inc. and Micom-Interlan, Inc. concurred that the Transmission Control Protocol/Internet Protocol can serve as a type of glue to link diverse products. The vendors all currently support TCP/IP or plan to announce TCP/IP products. In total, more than 150 vendors currently support the U.S. Department of Defense-spawned networking specification, said Robert Davis, product marketing manager at Excelan.

"Novell doesn't have a vested interest in making TCP/IP a connectivity platform or not," said Jamie Lewis, a senior technical analyst with the company. "We think it could be, and that's why we've supported it. We've found demand for it, especially in the government."

TCP/IP was developed by the Department of Defense in the early 1970s for use in its networks.

"The Defense Department spearheaded this effort and put the resources into testing, and the U.S. National Bureau of Standards set up certification," explained Michael Pliner, chairman and chief executive officer of Sytek.

"Then, because there was a lack of standards, the universities and the CAD/CAM industry began to pick up on TCP/IP as the protocol of choice. Once it became available, other groups wanted to make use of it. That's why you see local net vendors such as ourselves, Bridge [Communications, Inc.], Ungermann-Bass and others supporting TCP/IP," he added.

Despite growing support, vendors view TCP/IP as an interim solution, filling in for incomplete International Standards Organization Open Systems Interconnect specifications and products.

"Of the protocols that are out there right now, TCP/IP is the best thing we've got," Lewis said. "ISO certainly holds a lot of promise, but as Craig [Burton, Novell's vice-president of business development] is fond of saying, these people can't get together on whether they're going to have croissants or donuts for breakfast, much less what all these layers are going to look like. Sooner or later they will, and the DOD has specified that they're going to go ISO now. That'll play a big role, because whenever the DOD moves, half the country moves with it."

All of the vendors said they believe TCP/IP is here to stay, claiming that it has gathered the necessary momentum to coexist with ISO when products based on ISO standards become generally available. Although the vendors differed on when such products will be available, they agreed that ISO systems will not dominate the market for at least three years.

"Despite its weaknesses or shortcomings, TCP/IP gives you networking capabilities today. And that's why everyone's doing it," said Mark Bercow, network technology product manager at Micom-Interlan.

Those interviewed agreed that one of the things TCP/IP lacks is net management capabilities. According to Bercow, "Network management is probably the most notable flaw — there really is no network management in TCP/IP. However, we're hopeful that the Internet Task Force will begin to solve that problem."

The task force is a group of some 90 vendors, researchers and users working to define tools and standards to manage data communications systems containing products from many TCP/IP vendors.

The group is working under the direction of the Internet Activities Board, which is a group similar to the ISO.

Bercow and Lewis both said TCP/IP is also not the best protocol for work group networks, such as personal computer networks. "An overall weakness of TCP/IP is that the applications layers are very unsophisticated," Bercow said. "They only provide very simple types of networking utilities. There is no file access or file-sharing protocol in the TCP/IP environment. That's reason alone why it doesn't make sense in a homogeneous networking environment."

Davis added, "TCP/IP is fully defined up through all seven layers of the OSI model, although it's less defined at the higher layers," he said. "Some of the interfaces are not as well defined. It's defined — at least the message passing is — up through the applications layer, which gets you to the host."

TCP/IP also lacks adequate security functions — there is no user level security authentication, according to Bercow. But more significantly, there is no interoperability testing organization.

Since TCP/IP is incomplete, vendors or users may opt to provide their own solutions, which could lead to compatibility problems, Bercow added.

Other task forces working with the Internet Activities Board are grappling with TCP/IP's inadequecies. One task force looking for a way to allow personal computer networks to interoperate in TCP/IP environments is developing a standard interface between IBM's session-level Network Basic I/O System and lower layer TCP/IP protocols ("Vendors push interface," *NW*, March 23).

Standards jumble haunts EDI users

continued from page 1

However, participants in the effort to draft the ANSI X12 standard expect it will be several years before it is finalized.

To complicate matters, X12 by itself may not resolve all the issues that need to be addressed to facilitate deployment of intercompany EDI networks. Although X12 would standardize business forms — such as order forms and invoices — to be passed electronically, it does not specify communications parameters or protocols used to transmit these documents.

Described in broad terms, EDI is defined as a paperless, computer-to-computer method of processing business transactions electronically. Because EDI networks can expedite product delivery, decrease inventory and lower overall operating costs, companies have hastened to implement EDI networks based on homegrown standards.

In the past decade, industries-such as retail, transportation, automotive, grocery, hardware and pharmaceuticals developed their own industry-specific EDI standards for intraindustry networking.

The National Wholesale Druggists Association, for example, adopted the Ordernet standard for document interchange years ago. Similarly, the hardware industry developed the so-called Eagle standard.

In addition, several large corporations have implemented their own standards for EDI, forcing their suppliers and customers to comply with those standards. General Motors Corp. and K Mart Corp., for example, have taken the issue into their own hands by developing private EDI standards.

The Transportation and Data Coordinating Committee (TDCC) is one of the many industry-specific EDI groups that have cropped up. Although originally established to help the transportation industry move to EDI, the group later decided to develop the concept of a stable EDI architecture that would accommodate both industry-specific and generic needs of EDI users, said Ed Gilbert, president of TDCC.

Around 1980, Gilbert said, industries other than transportation saw the need to develop generic document standards all industries could use. TDCC then decided to act as secretariat to ANSI in the development of an X12 EDI standard. By that time, industry-specific standards had proliferated.

Undaunted, TDCC and several other committees representing industry users of EDI started participating in the drafting of an ANSI X12 document standard. As the work progressed and grew increasingly more time-consuming, ANSI spawned its own full-time secretariat to replace TDCC. ANSI's Data Interchange Standards Association (DISA) is now responsible for the coordination of X12 developmental efforts. TDCC coordinates the efforts of seven industry standards development groups participating in the X12 drafting.

Gilbert said X12 now incorporates 14 generic document standards, including those for purchase orders, change requests and requests for quote.

Evolution has been slow

But analysts said evolution of the standard has been slow as DISA and TDCC struggle to incorporate the diverse document needs of a large group of industries.

"It's a complicated process because each industry has peculiar needs," said Victor Wheatman, manager of the EDI Planning Service for Input, the Mountain View, Calif., market research firm. "For instance, the steel industry needs a way to electronically describe the finish on a metal."

But, Wheatman added, what's most important is that "most industries appear to be gravitating toward X12. That means that previously closed industry groups can deal electronically with each other across traditional industry lines — pharmaceutical vendors can communicate with the grocery industry through EDI, and so on."

"It is apparent that most industries are moving to X12," agreed Harriet Rusk, executive director of DISA. "I think we all want one standard, but I don't know if we'll ever get there," she said, citing the large number of industry-specific document needs.

John McQuillan, an independent consultant based in Cambridge, Mass., said "the speed with which different industries adopt X12 will vary. It's a question of relative benefit vs. relative cost. For large established EDI users, like the automotive industry, which has used EDI for 10 years, the benefit may be small — they already talk to everyone they want to talk to."

While some industries may be slow to adopt X12, the National Retail Merchants Association has worked hard to develop retail document standards for adoption by the ANSI X12 committee, according to Mike Baxter, manager of sales systems for Playtex, Inc. in Stamford, Conn.

NRMA is comprised of merchants including Levi Strauss & Co. and Montgomery Ward & Co., Inc., among others. "We have published a standard for purchase orders and are now working on invoice and shipping standards," Baxter said. Standards work has "taken off like a shot" in recent months, he said, due to the participation of heads of major retail powers.

Letters:

Editor:

Northern Telecom, Inc.'s Eastern region sales and service organization is a strategic corporate asset. It is an integral and highly successful part of our total distribution program.

Contrary to the unconfirmed report in your June 8 issue ("Northern may shed Eastern sales unit"), Northern Telecom is not engaged in any negotiations with Nynex Corp. or any other company involving the sale or transfer of its Eastern region direct sales group.

Desmond F. Hudson
President
Northern Telecom, Inc.

Big Blue barrage builds muscle

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communications software; enhancements to NetView, the company's host-based integrated network management system; and offerings that add new communications capabilities to the 9370 departmental processor, as expected ("NetView upgrade leading IBM blitz," *NW*, June 15, and "IBM details planned network offerings," *NW*, May 4). IBM also announced a joint marketing and development deal with T-1 multiplexer maker Network Equipment Technologies, Inc.

The products, some of which will not be available until well into next year, were seen as an important step in the evolution of SNA from a rigid, host-controlled networking scheme to a blueprint for communications between diverse processors without the need for host intervention.

The announcements transform SNA from a rigid host-based network model to a more flexible model capable of connecting a number of smaller networks, according to Frank Dzubeck, president of Communications Architects, Inc., a Washington, D.C. consulting firm. The keys to that transformation, he said, are the upgraded versions of VTAM and new capabilities for IBM's Network Control Program (NCP), software that resides in a front-end processor and complements VTAM's networking functions.

The new Version 3, Release 2 of VTAM includes an enhanced Application Program Interface (API) that supports Advanced Program-to-Program Communications between applications using LU 6.2 sessions. LU 6.2 is an IBM protocol that facilitates peer-to-peer communications between applications. VTAM will support communications between VTAM APPC applications and APPC applications running in other IBM systems, including the IBM System/36, System/38, System/88, Series/1, RT Personal Computer or Personal Computer.

Analysts said the addition of LU 6.2 support to VTAM should help establish LU 6.2 as a de facto standard for transaction processing. Migration to LU 6.2 has been slow because users have had to tailor host software to IBM APIs running on top of mainframe subsystems, such as IBM's CICS. API implementations differed slightly, preventing some LU 6.2 applications on different systems from sharing information.

By placing LU 6.2 in VTAM, IBM established a consistent interface for all host applications and simplified communications among LU 6.2 applications.

However, there are questions about how the VTAM LU 6.2 interface compares to other IBM and non-IBM implementations.

"The VTAM interface specifies only basic LU 6.2 functions, so users have no assurance that host LU 6.2 applications will function with other applications on other systems," said Steven Randesi, chairman of Gen2 Ventures, a consulting firm in Saratoga, Calif.

To help ensure LU 6.2 compatibility, IBM announced a service whereby customers can test LU 6.2 applications for conformance to the APPC architecture before installing them. The service, which will be available in the third quarter, will be provided through the company's Information Network value-added net.

Communications Network Architects' Dzubeck said the service would be welcomed by users who often have to ferret out LU 6.2 implementation inconsistencies. "A number of vendors implemented less than half of the available LU 6.2 functions," he said. The limited implementations often caused interoperability problems.

Through NCP, IBM also added PU 2.1 capabilities to its front-end processors, allowing them to establish SNA network sessions without host intervention.

"The addition of PU 2.1 capabilities to NCP will encourage users to link Personal Computers to Personal Computers or Personal Computers to System/36s through their SNA network," said L. David Passmore, a principal with Network Strategies, Inc., a Fairfax, Va., consulting firm.

The new release of VTAM also includes a dynamic path feature that makes it easier for network operators to reconfigure networks without interrupting operations. Customers will be able to change, add or delete communications paths without taking the entire network down.

"For almost 10 years, customers have been asking IBM to make it easier for them to make network changes," noted Passmore. "IBM finally delivered."

VTAM was also tweaked so customers could more easily maintain communications if a front-end processor failed. A second front-end processor is now able to take over communications responsibilities of the attached devices without losing any sessions. An operator can invoke the backup function over either a leased or switched line.

The 3174 controller is now able to supply single-session terminals, such as the IBM 3178, with multiple-session capabilities. A terminal can interact with up to five host sessions, running on a maximum of one IBM and one ASCII host. The number of logical units has been expanded from 128 to 180. The product will support a 20M-byte hard disk, a feature that will become available in the second half of next year at a cost of $1,875, with an additional $148 annual licensing charge.

The new release of VTAM will be available for MVS and VM operating systems in the third quarter of next year, and it will be available for the VSE operating system in the fourth quarter.

The initial cost of a VTAM license ranges from $963 to $6,255, and the monthly licensing charge runs from $321 to $2,085.

Included in last week's announcements was a new release of the Series/1 operating system, Event Driven Executive V.6, which supports LU 6.2 and PU 2.1. The operating system will be available in the first quarter of next year with a one-time charge ranging from $3,100 to $7,320, and monthly license charges ranging from $225 to $490.

A new product, IBM 3737, provides channel-to-channel communications between IBM 370 host systems over a T-1 line.

The product is designed for disaster recovery applications, costs $72,000 and has a monthly licensing charge of $635.

IBM also added LU 6.2 and PU 2.1 to Systems Application Architecture, which enables software vendors and users to develop applications that will run on a variety of IBM 370, System/3X and Personal Computer processors.

Sytek readies baseband net

continued from page 1

The line will include an 80386-based server, a personal computer board that supports Transmission Control Protocol/Internet Protocol (the 4130 TCP/IP PC Card), a host controller for Digital Equipment Corp. VAX superminicomputers (the 4010 Ethernet VAX Host Controller) and a DEC MicroVAX host controller (the 4020 Ethernet MicroVAX Host Controller).

The line also includes the 4080 eight-port fan-out unit, which supports multiple workstation connections, two Ethernet transceivers and two repeaters, including a fiber-optic repeater.

Sytek, which recently laid off 14% of its work force, including several high-level executives, is also planning to offer the 8050 bridge between its broadband LocalNet 6000 — an enhanced version of the IBM PC Network that Sytek developed for IBM — and the new baseband offering, according to a source close to the company.

Opportunity has been less than great for Sytek's mainstay market — the asynchronous terminal-to-host networking market. The firm, which saw a general softening in that market, reportedly lost more than $1 million in its third quarter, which ended Feb. 28, the last time the firm released financial figures ("Sytek on the block," *NW*, April 27). Support of Ethernet is expected to improve sales, according to the source.

"For Sytek's end-user sales force, products such as Ethernet have a high degree of demand in targeted environments," the source said. "Ethernet is important both for departmental networking and host connectivity. It's obviously a direction Sytek needs to move in."

In a speech at the Localnet East trade show on the state of network standards, Sytek Chairman and Chief Executive Officer Michael Pliner also alluded to a new Sytek multiprotocol architecture that would enable dissimilar devices to communicate with servers using native protocols, rather than going through gateways.

During his talk, Pliner showed a slide depicting a Sytek "multiprotocol terminal server" supporting a variety of protocols. They included the Department of Defense's TCP/IP, International Standards Organization protocols, proprietary Sytek protocols and other protocols.

The new 80386-based server, the 4430, which was being demonstrated at the Localnet East conference last week, is compatible with Sytek 6000 broadband networks, as well as the Sytek 4000 baseband Ethernets, the source said. The server was designed to support Novell's NetWare 286 network operating system in either environment.

The server will allow files, programs, printers and other network resources to be shared. The server was tested by an independent benchmarking organization, which called it the fastest server it has tested with Novell's NetWare 286, according to the source. "That begins to show that a single Sytek server can support very large departments," he said. "That's very significant for Sytek's larger systems marketplace."

The server includes 2M bytes of random-access memory and provides up to 135M bytes of formatted disk storage. The server also includes one serial and two parallel printer ports and three 16-bit IBM Personal Computer AT-compatible expansion slots for add-in boards and a 32-bit memory slot. The server's 32-bit processor runs at 16 MHz. The target price for the server is $11,500 and should be available at the time of the announcement, according to the source.

Sytek officially announced at Localnet last week a new IBM-compatible Token-Ring adapter for personal computers. Sytek claims it is the only adapter available that fully implements both the IEEE's 802.2 logical link control (LLC) and the 802.5 token-ring standards. It is also compatible with IBM's implementation of the LLC-Type 2 protocols, which ensures interoperability of Sytek and IBM Token-Ring cards in the same network.

INDUSTRY UPDATE

Gandalf to offer common shares

Gandalf Technologies, Inc. last week announced its intent to issue in July another offering of common shares over the Toronto Stock Exchange. The money will be used for "general working capital purposes" and to retire short-term debt. The company just reported a 74% increase in third-quarter net income and a 25% increase in revenue, as compared with the third quarter ended May 2 last year.

T-1 MUX MARKET

NET seeks edge via IBM

Big Blue acquires IDNX mux rights, funds future products.

BY PAM POWERS
Senior Editor

NEW YORK — Network Equipment Technologies, Inc. (NET) last week announced a joint marketing and development agreement with IBM that gives IBM nonexclusive rights to market, install and service Redwood City, Calif.-based NET's Integrated Digital Network Exchange (IDNX) T-1 multiplexers and related equipment.

News of the agreement came amidst a deluge of IBM communications product introductions here last Tuesday. Neither company would disclose the value of the agreement. NET's deal with IBM also calls for IBM to contribute an undisclosed amount of funding toward future NET product development.

In addition, the agreement calls for Big Blue to

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Network Equipment Technologies, Inc.'s fortunes soar

Year ended March 31

	1987	1986	Percent change
Net sales	$47,410	$8,657	448%
Net income	$5,077	($6,215)	182%

(dollars in thousands)

- Founded May 1983
- 500 employees

- Product line Includes T-1 networking multiplexers and network management systems.
- Customers Include American Airlines, Inc., Electronic Data Systems Corp., Hughes Aircraft Co., IBM, Sears, Roebuck & Co., The Travelers Insurance Co. and U.S. Department of Defense.

SOURCE: NETWORK EQUIPMENT TECHNOLOGIES, INC., REDWOOD CITY, CALIF.

INDUSTRY EYE

JOSEPH BULSAK

Versatile clocking is top T-1 priority

The growing use of T-1, high-capacity digital communications services is bringing to light the benefits and drawbacks of different types of network synchronization timing techniques used by various multiplexer manufacturers.

As Integrated Services Digital Networks edge closer, service providers are enticing users with a blend of aggressive marketing and innovative high-speed services. In response, increasing numbers of users are migrating toward a multicarrier environment as the most cost-effective way to accommodate future network growth and changing demands.

As a result, the timing has never been better to reap the economic and performance benefits of recent advances in T-1 technology and the price drop in T-1 facilities. Faced with a plethora of high-speed network facilities, users can negotiate for the best price and fastest installation of T-1 facilities.

With the increase in multicarrier environments, the need for transparent clocking support on T-1 products will grow correspondingly.

Fundamentally, there are two different approaches for handling network timing. T-1 networking products that use a locked-clock scheme require all timing sources from various T-1 facilities to be synchronized or locked. Typically, this locked-clock scenario doesn't pose any problems if the network user relies on one carrier for all T-1 networking because the user is dealing with one master clock.

However, multicarrier networks that use different service providers operate at slightly different clock rates because each provider typically uses a different master clock. The inability to compensate for different timing of the master clocks causes slips — which result in information loss.

> With the increase in multicarrier environments, the need for transparent clocking support on T-1 products will grow correspondingly.

On the other hand, T-1 products that support a transparent clocking scheme allow users to mix and match network services without concern for incompatible clock sources. This versatile timing approach automatically compensates for different clocking, giving users the flexibility to integrate multiple services within the same product.

With transparent clocking, users exercise the greatest level of selection control over T-1 networks growing in both size and complexity. Versatile clocking not only accommodates different T-1 carrier facilities operating at slightly different clock rates but accepts different speed facilities such as international gateway applications (1.544M to 2.048M bit/sec). In addition, transparent clocking allows users to maximize other network alternatives.

Currently, several leading T-1 equipment vendors are taking different approaches to address the impact of locked clocking in multicarrier environments. The optimal method uses an automatic, transparent technique of compensating for varying clocking sources.

As users grow more accustomed to a rich mix of voice, data and video services, they will become more concerned with the cost of services and the cost and reliability of maintaining large-scale, multicarrier networks. In the long run, versatile clocking will become the key to maximizing integrated digital networking to satisfy a broad range of communications needs.

Bulsak is director of product development at Infotron Systems Corp. in Cherry Hill, N.J.

BRIEFS

AT&T announced the renewal of a multimillion dollar computer products distribution agreement with **Ducommun Data Systems.** For another three years, Ducommun, which is AT&T's largest value-added systems distributor, will sell AT&T's multiuser systems, personal computers, software and other products to value-added resellers.

$

TIE/communications, Inc. extended four resale agreements. GTE Corp. will sell TIE's mid-range key telephone systems for two more years.

Bell Atlantic Corp., Nynex Corp. and US West, Inc. agreed to extend their contracts for key systems, hybrids and data private branch exchanges for another two years.

$

Ameritech last week appointed Gerald A. Malik, formerly vice-president of operations services for Ameritech Services, to the post of president of Ameritech Development Corp.

$

ALC Communications announced that its carrier subsidiary, **Allnet Communications Services, Inc.,** has been granted a $30 million line of revolving credit that will provide added resources as Allnet attempts to expand its network and its market share.

$

Infotron Systems Corp. was awarded a $500,000 contract from Crown Life Insurance Co. in Toronto for the provision of NX4600/NX3000 high-speed switches and upgrades to existing 992NP Network Processors.

$

Novell, Inc. announced a 106% increase in sales for the second quarter of fiscal year 1987, as compared with the corresponding period last year.

Net income for the second quarter, which ended May 2, 1987, was $4.5 million, compared with $2.7 million in the second quarter of the last fiscal year. There was a 23% increase in revenue in the second quarter from the first quarter of 1987.

$

Telenet Communications Corp., a division of US Sprint Communications Co., received a contract for an undisclosed value with Porsche Cars of North America for data communications services over the Telenet Public Data Network (PDN).

The network will be used to interconnect the company's 324 automobile dealerships nationwide to Porsche's U.S. headquarters in Reno, Nev.

NET seeks edge via IBM

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implement NET's internodal proprietary protocol in its own products. An NET spokesman said the protocol provides network intelligence to each node, so that any NET node in a network can reroute traffic around failures, allocate bandwidth or perform other networking functions.

An IBM spokesman declined to elaborate on which IBM products will be modified to support the protocol.

The NET spokesman said IBM's plans to integrate the NET protocol are "a tangible demonstration that this is much more than a simple remarketing agreement" between the two companies. It will be some time before NET's bottom line benefits from the arrangement, he said, but the IBM partnership represents an important long-term opportunity for NET.

It will be some time before NET's bottom line benefits from the arrangement, he said, but the IBM partnership represents an important long-term opportunity for NET.

The IBM spokesman said NET's IDNX product line was chosen over competitive products because it was "the best suited to our product mix and our customer needs. A number of our customers are delighted with this agreement."

Andy Schopick, vice-president and senior analyst with Stamford, Conn.-based Gartner Group, Inc., said it is questionable whether NET's liaison with IBM will generate a significant number of sales for NET.

"The impact of these types of relationships with IBM is often more psychological than real, but undoubtedly this will have a positive impact in that it will enhance NET's image and stature," Schopick said.

The agreement comes at a critical time for NET, as the T-1 multiplexer maker is seeking new distribution channels to expand its customer base. "The IBM agreement is part of a larger company strategy to extend our presence in the marketplace," said Lloyd Collins, director of product marketing for NET.

According to Collins, the T-1 market functions on what he called "an adoption curve." Demand for T-1 multiplexers is now at a peak, Collins said, but it will begin to slack off in the next few years. NET's goal, he said, is to achieve wide market penetration as early as possible.

"We think people moving to T-1 will adopt it very quickly, particularly for their backbone networks. In order for NET to remain viable, we have to be out there for that early rush," he said.

Collins explained that because the company is still small and cannot afford to take on a large sales staff, it has to penetrate new accounts by working with other vendors.

As part of that strategy, NET last August acquired ComDesign, Inc., a maker of low-end data communications products. That acquisition, Collins said, was instrumental in extending NET's product range and, hence, its ability to reach a wider range of customers more quickly.

A recently announced joint marketing agreement with Doelz Networks, Inc., still being formalized, will give NET entry into the fast packet network market with the Doelz Esprit line of switches. Under that agreement, NET will build interfaces between the two companies' equipment so that both can be governed under common network management products.

Demand for T-1 multiplexers is now at a peak, Collins said, but it will slack off in the next few years. NET's goal, he said, is to achieve wide market penetration as early as possible.

While the success of NET's joint marketing strategy has yet to be determined, its brief history in the T-1 marketplace bodes well for its future. "NET is one of the most phenomenally successful start-ups to come along in years," Schopick said. "The company has strong momentum propelling it."

NET's momentum comes from rapid-fire growth since its inception in 1983. In four years, the company has expanded its product line, adding a low-end and mid-range T-1 multiplexer as well as a network management system to its original high-end multiplexer.

Despite heated competition from companies such as Timeplex, Inc., Cohesive Network Corp. and General DataComm, Inc., NET has landed some prestigious customer accounts that contribute to its favorable reputation. Since it went public in January, revenue has skyrocketed 448% to $47 million. ◻

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TELECOM TRENDS

Long-haul carrier sells switching centers

Telesphere International, Inc., a long-haul carrier that caters to businesses and hotels, recently announced the sale of two of three switching centers the company is divesting because it could not integrate into corporate fiber network plans. A switching location in Memphis, Tenn., was sold to Comlink 21, Inc., and another in Nashville was sold to Advantage Companies, Inc. The $6.6 million proceeds from the sale will increase working capital and improve Telesphere International's cash flow, the company reported. A facility in Little Rock, Ark., is also up for sale.

▶ *UNANSWERED CALLS*

Carriers decry proposed California billing limits

BY JOSH GONZE
Staff Writer

The California Public Utilities Commission (PUC) is scheduled to hold hearings next month that could result in regulations requiring AT&T's competitors to stop billing for calls of less than one minute, a ruling that could knock those long-haul carriers out of California.

The hearings stem from allegations that long-distance carriers other than AT&T sometimes charge for unanswered calls because of inadequacies in their billing systems. At issue is whether or not these carriers should be allowed to bill for calls of less than a minute — the type of calls alleged to be billed inaccurately — until they prove they can provide bills with AT&T-like accuracy.

Last December, a Santa Monica, Calif.-based billing-rights advocacy group called The Network Project prodded the state's PUC into passing a preliminary order requiring such proof. Attorneys for MCI Communications Corp. and US Sprint Communications Co. have succeeded in staying implementation of the PUC requirement until a decision is made next month.

The problem of billing for unconnected calls arises from deficiencies in the methods phone companies use to determine whether or not a call has been answered, a process called "answer-supervision." Long-haul carriers use different types of ports to access local exchange carriers, which provide varying degrees of answer supervision and billing information.

But it is unclear how serious a problem billing inaccuracies represent for customers of MCI, US Sprint and other competitors of AT&T. Harvey Rosenfield, director of The Network Project, and other observers claim unfair billing is common. "It's a serious and widespread problem," Rosenfield said.

But the carriers and analysts say it is a relatively rare occurrence. "I think it's much less of a problem than people think," said Robert Self, president of Market Dynamics, a long-distance research firm in New York. Self conceded, how-

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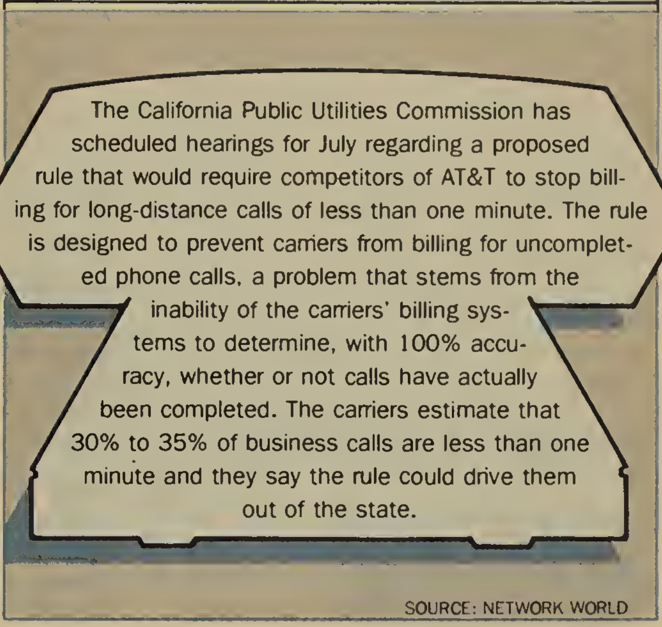
Battle over billing


The California Public Utilities Commission has scheduled hearings for July regarding a proposed rule that would require competitors of AT&T to stop billing for long-distance calls of less than one minute. The rule is designed to prevent carriers from billing for uncompleted phone calls, a problem that stems from the inability of the carriers' billing systems to determine, with 100% accuracy, whether or not calls have actually been completed. The carriers estimate that 30% to 35% of business calls are less than one minute and they say the rule could drive them out of the state.

SOURCE: NETWORK WORLD

TELECOM TIDBITS

The International Telecommunications Satellite Organization (INTELSAT) announced recently that **Reuters Ltd.,** the worldwide news agency, is the first commercial user of International Telecommunications Network (INTELNET), an international VSAT service.

Reuters is using INTELNET, which is based on spread-spectrum satellite technology, to transmit news and pictures to very small aperture terminal dish antennas in Latin America. Beginning in September, Reuters will transmit market quotations, stock exchange information and regional business news to financial clients in the region.

Service will be available to users with 1.4 meter receive-only antennas from the East Coast of Mexico to the Southern tip of South America.

Wisconsin Bell recently became the first Bell operating company to receive a Siemens Communications Systems, Inc. EWSD digital central office switching system, which was installed at Wisconsin Bell's Sheboygan Falls, Wis., office. The 4,200-line EWSD/DE4 replaces an existing electromechanical switch. The Siemens EWSD system will accommodate 100 to 100,000 subscribers.

Microtel Ltd. of Boca Raton, Fla., recently introduced a 1+ dialing service and a billing scheme based solely on usage instead of a flat monthly fee. LaserPlus service allows customers to make in-state and out-of-state long-distance telephone calls using regular business telephone lines. Increased usage will result in lower per-minute rates. The service also allows incoming, outgoing, local and long-distance calls to be carried over the same local business lines.

Infotron Systems Corp. was recently awarded a contract valued at more than $500,000 from **Crown Life Insurance Co.** in Toronto to produce six NX4600/NX3000 high-speed switching units as well as upgrades to existing 992NP Network Processors. Crown's network, which supports voice and data, is monitored and controlled from a central site in Toronto utilizing the Infotron Integrated Network Manager.

National Gateway Telecom, Inc. recently announced that its subsidiary, **FTC Communication, Inc.,** placed an order with **Bell Atlantic Corp.** for a DS3-capacity fiber-optic link to connect its Technical Overseas Control Center in New York with the Satellite City earth station complex in Carteret, N.J.

The 45M bit/sec fiber link will allow FTC to provide international business service to its customers in the New York area. FTC uses antennas to provide international business service to Belgium, Denmark, France, Germany, Italy, Ireland, the Netherlands, Norway, Sweden, Switzerland and the UK.

Cable & Wireless Management Services, Inc. has expanded its digital transmission offerings to include T-1 multiplexing and facilities management services. Through its T-Plex service, voice and data traffic for multiple points can be routed over a T-1 local access channel into the company's net.

Users can also link multiple locations in a single city to a single T-1 channel. With Tele-Site, users can house their communications equipment with Cable & Wireless' operations centers across the country.

The company will provide net management and technical support services.

Teleport Communications announced that **Lifetime Cabletelevision Network** will transmit programming via Teleport's fiber-optic network from the television company's headquarters in New York to The Teleport on Staten Island, N.Y. From there, it will be sent via satellite to affiliates throughout the U.S. Lifetime's studios are directly linked to the 150-mile regional fiber network. ◻

▶ *FIBER NETWORKS*

LDX, WilTel to merge net forces

BY JOSH GONZE
Staff Writer

CHESTERFIELD, Mo. — Regional long-distance fiber-optic carrier LDX Net, Inc. agreed last week to merge with fiber carrier Williams Telecommunications Co. (WilTel) to form a company with 10,000 miles of fiber-optic facilities reaching coast to coast.

The new company, as yet unnamed, will offer private-line services to existing and new customers between most major cities in the U.S. The network will consist of 5,000 miles of existing fiber and 5,000 miles of fiber capacity held under long-term lease.

Cities to be served by the new company include New York, Washington, D.C., Atlanta, Chicago, Minneapolis, St. Louis, Mo., Dallas, Houston, Denver, Los Angeles and San Francisco.

The proposed merger, made between LDX parent company Kansas City Southern Industries, Inc. and WilTel's parent, The Williams Companies, Inc., is awaiting final approval from the two companies' boards of directors and the U.S. government.

LDX Net, founded in 1984, currently has 350 employees. It pro-

See page 10

▶ *FLOOD RECOVERY*

Red River rolls over

LDX Net is back on-line in a few hours.

BY PAM POWERS
Senior Editor

ST. LOUIS, Mo. — A section of LDX Net, Inc.'s fiber-optic network serving several hundred users was damaged by flooding here recently, but the carrier was able to restore service within hours due to cooperation from competitive fiber carriers.

Flooding along the Red River eroded the river banks LDX uses as a right of way for part of its fiber cable extending from Dallas to Oklahoma City. Damage to the cable resulted in a service outage that could have lasted days, said LDX Net President Don Hutchins.

LDX Net, which provides private-line service to common carriers and business customers, responded with calls to Williams Telecommunications Co. (WilTel) — a company with which LDX now plans to merge (see "LDX Net, WilTel link U.S.," page 9) — Consolidated Networks, Inc. (CNI) and Lightnet, Inc., asking for alternate routing capacity across those carriers' fiber cable. With the local phone companies, LDX Net and its competitors established two alternate routes for LDX Net customer traffic affected by the outage.

Using Lightnet facilities, LDX Net rerouted some traffic from Dallas to New Orleans to Indianapolis, where it was routed over CNI facilities to LDX Net in St. Louis.

The second alternate path was established from New Orleans to Chicago on Lightnet, from Chicago to Kansas City on WilTel and from Kansas City back onto LDX Net facilities.

Hutchins said several hundred LDX Net customers lost service for a few hours before the alternate routes were put in place. Hutchins declined to name customers or comment on how they have been affected by the outage.

The rapid restoration of service was important to Lightnet and to the entire fiber-optic industry, Hutchins commented, because "people put a lot of eggs in the fiber basket and consequently have concerns about failures. They want to know that service can be restored quickly." High-capacity fiber facilities increase the danger of creating a single point of failure.

A spokeswoman at Lightnet agreed with Hutchins, saying the exercise would do much to dispel the conception that fiber carriers are incapable of providing uninterrupted service.

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LDX, WilTel to merge

continued from page 9

vides private-line services to about 1,000 users and to some larger long-distance companies. It owns fiber connecting St. Louis, Kansas City, Kan., and cities in Texas and Louisiana. The company has $90 million in bank debt, which will be paid off at the merger.

Wiltel, based in Tulsa, Okla., owns fiber connecting Chicago to Los Angeles and sells long-distance services to corporations and government agencies. In the first quarter of this year — the first time the company provided financial data — it reported revenue of $3.2 million and an operating loss of $5.5 million.

Both companies currently lease fiber facilities to service the East Coast. LDX Net will own 19% of the new company, and 81% will be owned by Wiltel.

Carriers decry billing limits

continued from page 9

ever, that "there is a problem, and you have to be aware of it because, depending on your calling pattern, it can cost you money." Users have to take it upon themselves to avoid being victimized, Self said.

According to carriers that would be affected by the California PUC action, the proposed rule would significantly reduce revenue. Since differences in local exchange access prevent AT&T competitors from attaining the same level of error-free billing as AT&T, the proposed rule would force them to stop billing for all calls of less than one minute. According to Self, 30% to 35% of business calls are less than one minute in duration.

"Businesses make a lot of short phone calls, so you're talking about a significant chunk of revenue for all of the [other common carriers]," a US Sprint spokesman said of the proposal. "If you factor into that the kinds of margins we all operate on, it seems to me that you could make an argument that we and other OCCs might think real hard whether we want to stay in California."

"It has a potentially devastating impact on the carriers," agreed Robert Schwartz, vice-president of Bill Correctors, Inc., a San Rafael, Calif.-based company that tries to get refunds for clients that have been misbilled.

Long-distance carriers do have refund policies customers can use to get credit on bills paid for unanswered calls. US Sprint and MCI notify customers of the credit policy in mailed literature. Neither company will divulge how many refunds have been given or how much the refunds total. No reliable estimates of how often unanswered calls are billed have been made public. The Network Project's Rosenfield said his group has received between 100 and 200 complaints.

The PUC has ordered all telephone companies operating in California to furnish it with information concerning their billing practices and procedures, including charges for calls not completed. Rosenfield said he believes the true extent of the problem will be revealed at the July hearings.

Prior to the equal access rule put into effect on Jan. 1, 1984, AT&T was automatically given access through trunk-side ports, so-called Feature Group C ports used to support links between network switches. The other common carriers typically interfaced to the local exchange through line-side ports, Feature Group A ports used to support customers, which do not have advanced answer supervision capabilities.

Feature Groups B, C and D trunk ports — some of which are older port types — provide signaling to allow carriers to determine accurately whether or not a call has been answered. Carriers restricted to Feature Group A at the local exchange are forced to make an educated guess as to the answer/busy status of each telephone call.

Typically they do this by presuming that calls have been answered if they are held beyond a certain number of rings, in effect, charging callers for ringing the phone too many times. This practice provides the logic behind The Network Project's proposed remedy of disallowing all charges for calls of less than one minute.

"It's ridiculous to put the burden on consumers to rectify repeated billing mistakes by the companies," Rosenfield said. "If the companies couldn't show that they have an error rate similar to historical expectations of consumers — and that would be basically AT&T's error rate, which appears to be zero — then they wouldn't be permitted to bill for any one-minute calls. That would shift the burden of phony charges from the consumer to the company."

MCI has tried to create more sophisticated answer-supervision on Feature Group A by installing frequency monitoring devices at both the initiation and termination ends. But any attempt to determine through Feature Group A whether or not a call is answered is ultimately an educated guess. "Software answer-supervision is an attempt to approximate what you would get with hardware answer-supervision," said Phyllis Whitten, a US Sprint attorney involved with the California case.

Local exchange carriers offer equal access — trunk-side ports and associated high-quality answer-supervision — in about 60% of the U.S.

"We have an express goal of moving away from A and onto either B or D for termination," said Jim Lewis, an attorney for MCI also working on the California hearings. "Whenever the local exchange companies provide hardwire answer-supervision, we purchase and utilize them."

Once an AT&T competitor has access through a trunk-side port, it needs to adapt its billing system to take advantage of the signaling. MCI and US Sprint say they are trying to accomplish that change as quickly as possible.

Self agreed the two major AT&T competitors are rapidly getting higher quality answer-supervision and the gear to take advantage of it. "I suspect that very soon the national carriers besides AT&T will be getting 95% of their calls on answer-supervised circuits," he said. Self also said he guessed that the two companies already have a significant portion of their calls on hardware answer-supervision circuits.

DATA DELIVERY/ NET MANAGEMENT

> “To move up toward the corporate boardroom, communications managers have to leave their technical experience behind and become more involved in their companies' strategic business planning.
>
> **Tony Holland**
> Manager of communications
> and technical services
> SRI International
> Menlo Park, Calif.

APPLICATION-TO-APPLICATION COMMUNICATIONS

DDM topples data barriers

Study says IBM architecture a flawed but important tool.

BY JOSH GONZE
Staff Writer

IBM's Distributed Data Management (DDM) is a robust architecture that hacks away at the barriers to data sharing, but shortfalls in current DDM implementations limit its capabilities and pose the threat of net performance problems, according to a report released recently by Gen2 Ventures.

Simply stated, DDM describes how data can be exchanged by applications running on diverse processors in a network. Its goal, the consulting firm's report says, is to bring data management standardization to dissimilar IBM systems.

DDM has been implemented on a number of IBM systems. The DDM products, working hand in hand with other IBM system software, serve to locate data in a network, send the request for the data to the system where it resides, handle necessary data-translation functions and transmit data back to the requesting application. All the current implementations use IBM's Advanced Program-to-Program Communications.

DDM spells out a system-independent set of commands, protocols, file types, access methods and data structures to and from which existing data management systems can be mapped. The DDM architecture forms the common denominator between existing and incompatible data management systems running on different machines.

To date, DDM has been implemented on IBM mainframes running under MVS with CICS, the System/36 and System/38 minicomputers and, in a limited way, working with NetView/PC on the Personal Computer. However, IBM Personal Computers cannot yet fully participate in a general DDM network, according to the Gen2 report. No non-IBM products have implemented DDM.

For users, DDM's benefits include file translation between incompatible systems, provision of a growth path for incorporation of new computers and a potential means to integrate non-IBM gear into their networks. One inherent strength is that application programs do not have to be rewritten to work with DDM, the report says.

But shortfalls in both its architecture and the product implementations announced so far limit DDM's capabilities and create potential network performance problems, the report says. Architecturally, DDM is not a fully distributed data base management system because it only works with record-oriented files.

Byte-stream files, which run on all personal computers and on Unix-based systems, cannot currently be accessed with DDM software. Gen2 Ventures President Don Czubek said IBM has announced plans for DDM enhancements that will bring byte-stream files into DDM's orbit.

Another architectural shortcoming is the lack of a method to prevent files on different systems from sharing a common name. Network managers must find a way to do that themselves, according to the report.

The report cites some potential implementation problems that users should watch for, including slower response times due to DDM overhead, erroneous looping of requests between systems due to improper configuration and security breaks in large networks. Non-IBM implementations in the future must be carefully tested because vendors will be using different subsets of the DDM architecture in their products. The report notes that it is important to use those subsets of DDM that are used by the individual IBM products with which a link is needed.

Non-IBM vendors must select subsets of DDM architecture to create interfaces for application programs, data management programs, communications programs and operating systems. So, even though DDM architecture and operation are well-defined, no two DDM implementations will be the same, the report contends.

The need to remain IBM-compatible and to market equipment that can work in an IBM network will pressure other vendors to add DDM support to their systems. Minicomputer manufacturers will feel the most pressure, the study states.

The report fleshes out DDM's relationship to SNA, explaining that while all current implementations use LU 6.2 protocols for communications, DDM is an independent architecture that does not necessarily require SNA.

The DDM file models, access methods, commands and data stream structures are explained in detail. Those four elements will be the objects of proprietary counterparts being mapped into the DDM world.

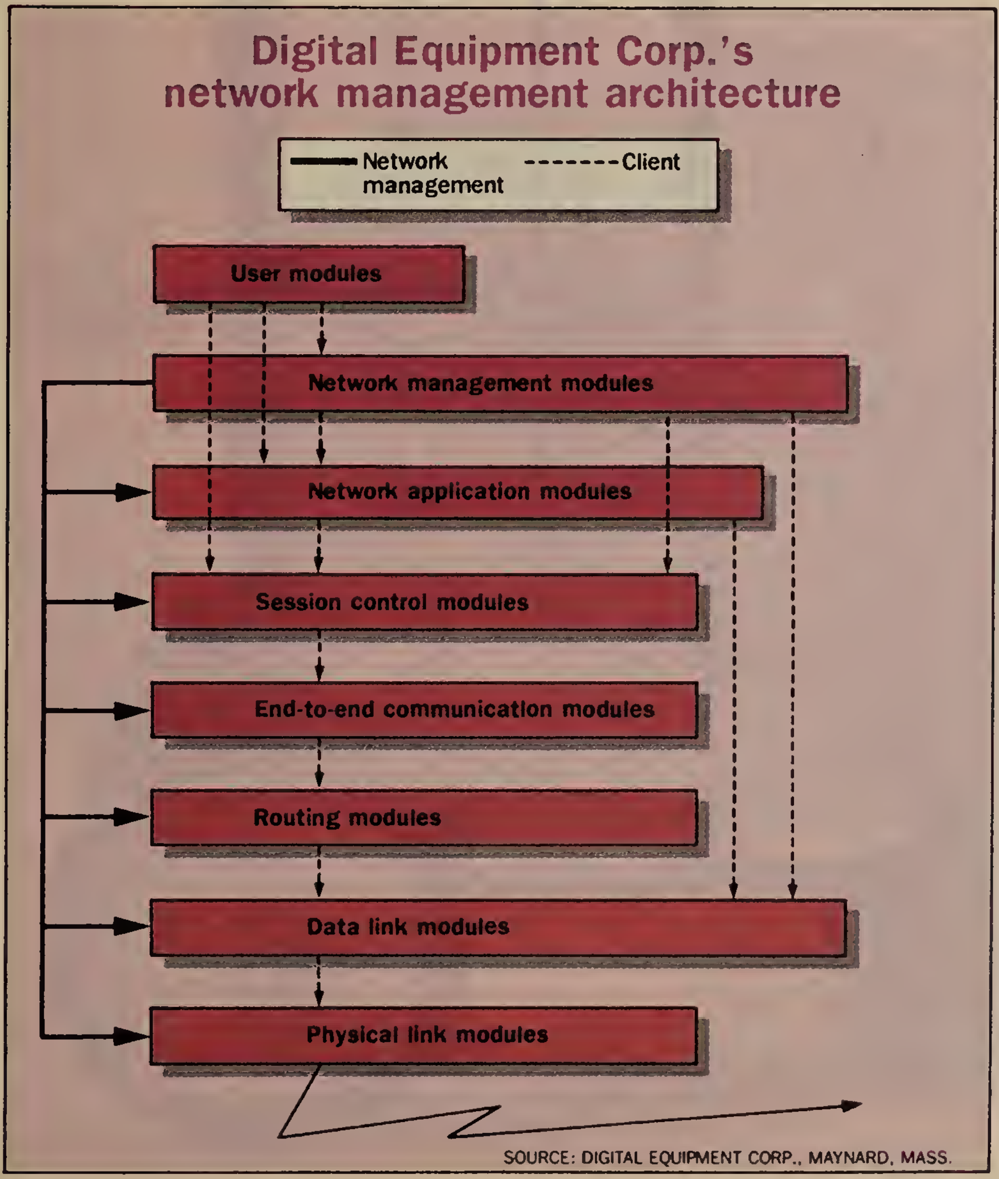
IBM's goal in architecting, implementing and publishing DDM specifications is to solve the incompatibility problem of their major systems at the record-oriented level.

“IBM's Distributed Data Management” is available for $395 from Gen2 Ventures, 12930 Saratoga Ave., Saratoga, Calif. 95070. ◾

DATA DIALOGUE

BY MICHAEL LATRIANO

Net management: SNA vs. DNA


Digital Equipment Corp.'s network management architecture
Network management
Client
User modules
Network management modules
Network application modules
Session control modules
End-to-end communication modules
Routing modules
Data link modules
Physical link modules

SOURCE: DIGITAL EQUIPMENT CORP., MAYNARD, MASS.

Part 1 of a two-part series.

Network management architectures will be a major area of competition between vendors in the coming years.

Much has been written about IBM's Systems Network Architecture and its metamorphosis since its introduction in the early 1970s. Digital Equipment Corp.'s Digital Network Architecture (DNA) has evolved over a parallel time span. The latest phases of both DNA and SNA have seen the introduction of long-awaited network management products.

DNA, announced in 1976, went through four phases of development, each bringing new capabilities to the DECnet line. Since Phase 1, DNA has been a peer-to-peer networking architecture. The model supported synchronous, asynchronous and parallel communications for point-to-point communications and file transfers.

See page 14

Latriano is a consultant in the Management Consulting Group at Price Waterhouse & Co. in New York.

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NETWORKING

SNA vs. DNA

continued from page 11

Unlike SNA, which is evolving from a centralized master/slave hierarchy to incorporate peer-to-peer capabilities, DNA has gone through a reverse evolution to accommodate centralized management and control requirements in large networks.

Although Phase 2 of DNA introduced several new operating systems, such as VMS, and processors like the VAX, communications remained point-to-point using synchronous, asynchronous and parallel communications devices.

DNA had a role in making VMS the current DEC operating system standard. When the VMS group was developing Version 1.0 of the operating system, the basic DECnet network management architecture had already been laid out. Bob Stewart, one of the original designers of DEC's network management architecture, is convinced that DECnet compatibility is the major reason VMS has become the de facto standard.

"VMS had the opportunity to integrate DECnet management features, while none of the other operating systems did," said Stewart, who currently works at Xyplex, Inc. "That level of integration makes the VMS implementation of DECnet really easy to use."

Phase 3 added a distributed network management capability, so the installation, configuration, operation and maintenance of a DEC network could be done by one or more systems serving as management nodes in a network.

In 1984, Phase 4 added Ethernet and X.25 networks to the DNA architecture. DNA is a layered model and uses architecturally defined interfaces to communicate between adjacent layers. The architecture specifies the functional interfaces between the various layers and creates a strict layered partitioning of the architecture.

The figure on page 11 defines the DNA layers and the interfaces between them. At the user layer, DNA defines its network control program. The network control program implements the network command language specified by the DNA network management architecture and provides a user-defined interface to DNA network management functions. User access to the network management layer enables programmers to write applications that enhance the capabilities provided by DEC. So, development of many network management functions has been left up to the user.

Currently, DEC network management products provide most of the operator tools needed to control the network. However, they do lack many important items. "It's very embarrassing for a network manager to have to be told by a remote user that a part of the network is down," says Howard Niden, formerly a DEC systems designer with Pacific Telesis Group and currently a consultant with Price Waterhouse's Pittsburgh Management Consulting Group. "The tools are there, but they don't have the threshold monitors and alarms."

Also, DEC does not provide the net management tools for planning network growth or managing a network budget. Ironically, performance monitoring tools tend to create significant processor overhead and thus can degrade performance and response times.

Network management products illustrate vendors' networking strategies. IBM's strategy is clear, the need to centrally collect and massage information accumulated by various network components will keep users tied to the IBM mainframe.

Traditionally, DEC has always pursued a coexistence strategy with IBM, allowing DEC VAXes to be controlled from an IBM host.

Recent announcements from both vendors indicate a strategy to support multivendor network management capabilities. IBM is addressing this issue by filtering non-IBM network statistics through NetView/PC. DEC uses standards to monitor non-DEC equipment. Currently, DEC can monitor non-DECnet Ethernet devices at the Open Systems Interconnect Levels 1 and 2.

DNA's strategic goals and architectural guidelines support such integration. Phase 5 of the DNA network management architecture, which will begin in 1988, will follow these strategic goals.

New products should incorporate basic network management functions when introduced, such as remote access to management functions and an integrated management architecture.

Commonality in user interfaces, data bases, protocols and functions reduces complexity, makes the products easier to use and reduces the duplication of development resources. More intelligent and automated data-analysis and evaluation functions are needed to address the network management requirements of all network products.

The distinction between voice and data networks is becoming less clear, and network management must consider both. Network management is a distributed application with centralized control that should be integrated into the overall system environment.

Part 2 of this series will delve further into DEC's network management products, such as TSM, RSM and Ethernim, and it will examine their strengths and weaknesses. ■

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LOCAL NETWORKING

Operating system titans clash

A battle may be brewing between operating system vendor Microsoft Corp. and network operating system vendor Novell, Inc. Microsoft, which has been quite friendly with 3Com Corp. of late, is trying to position its new LAN Manager software as the Operating System/2-based networking standard. But Novell, which is rumored to have dubbed itself the Microsoft of networking, has also been working with independent software vendors. Novell "looks like it's getting ready to take Microsoft head on," commented Larry Stephenson, executive vice-president of Gateway Communications, Inc.

LANMARKS

PAULA MUSICH

Token-Ring quietly gains acceptance

When IBM's Token-Ring Network was announced over a year and a half ago, many vendors claimed demand for their Ethernet networks actually rose. Even though a number of independent networking vendors such as Ungermann-Bass, Inc. and Bridge Communications, Inc. quickly introduced their own IBM Token-Ring-compatible offerings, demand for these offerings was reportedly disappointing.

Industry pundits and Ethernet purveyors explained that weak demand for the Token-Ring was due to buyers' faith in a stable, mature installed base of Ethernet products that users were familiar with and vendors were experienced in supporting. Once users saw what the Token-Ring was all about, observers reasoned, they decided it wasn't such a big deal and merrily went on buying Ethernet.

Wrong. Many data processing, MIS and microcomputer managers did seriously consider IBM's Token-Ring. But, rather than wholeheartedly embracing Token-Ring technology, they cautiously chose to test the new technology to prove that, just like Ethernet, it worked and was a worthwhile investment.

Many who had never purchased a local-area network bought small, pilot networks. They kicked the tires, experimented with the Token-Ring's performance and features, tested IBM's commitment to support of the network and found that it was good.

So many of these pilot installations were successful that IBM couldn't keep up with the demand for Token-Ring adapter cards for its Personal Computers. All this happened even before links to the System/370 and System/36 became available.

Now, despite Ethernet's six-year lead on IBM's Token-Ring, IBM is overtaking Ethernet vendors as the networking vendor of choice. Two recent surveys, one of *Network World* subscribers and the other of microcomputer managers in large organizations, found that more people planning to buy networks will install IBM's Token-Ring Network in the next 12 months than DEC's Ethernet. Buyers in Europe, where a strong anti-IBM mentality exists, can't buy Token-Ring adapters fast enough, and rumors of a shortage in the U.S. persist.

The LAN lion's share

This is not to say that Token-Ring technology will replace Ethernet — the two will coexist and together make up the lion's share of the installed base of

See page 16

COMPANY PROFILE

Network General smells success with Sniffer

Firm's protocol analyzer making waves in industry.

BY MARY PETROSKY
West Coast Correspondent

SUNNYVALE, Calif. — Never mind that the name of its product conjures up images of a bloodhound with a bad cold. Start-up Network General Corp. is celebrating its first anniversary this month and boasts a customer list that reads like a who's who of the computer networking industry.

IBM, Digital Equipment Corp. and Wang Laboratories, Inc. are among the computer vendors using Network General's local network protocol analyzer, The Sniffer. Introduced last September, The Sniffer has also attracted the attention of vendors of personal computer networking and 3270-type products, said Harry Saal, president and founder of Network General.

Users of The Sniffer include Proteon, Inc., Sytek, Inc., 3Com Corp., Digital Communications Associates, Inc., Micom-Interlan, Inc. and NCR Comten, Inc. In addition, corporations that have large personal computer nets, such as United Airlines, Inc., Baxter Travenol Laboratories, Inc. and Travelers Insurance Co., are also using The Sniffer, Saal noted. "These are companies that are designing their own network-based applications used in selling their products or delivering services," Saal said.

Network General currently sells The Sniffer primarily to developers, as opposed to end users, observed Mark Stahlman, research analyst for Sanford C. Bernstein and Co., New York. "I think that strategy is a smart one," Stahlman said, adding that the company will be able to build a reputation in this manner.

Saal founded Network General last June with his colleague of many years, Len Shustek. Both men were also founders of Nestar Systems, Inc., a local networking company. The founders have kept the company small. Manufacturing and assembly, along with some software development, is done by outside vendors, Saal said. Although he noted that the company is already profitable, Saal refused to release any financial information. Network General is a private company and is not required to release its revenue figures.

A network analysis and diagnostic tool, The Sniffer is capable of capturing all, or a subset of, the packets of data transmitted across a local-area network. It can monitor real-time system performance and can be configured to watch for specific events, such as monitoring for a particular type of error or tracking traffic between two nodes. One key use is in the development and debugging of network protocols, hardware and software, Saal said.

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FIBER-OPTIC LANS

Apollo unveils TEMPEST units

Products meet DOD security regulations.

BY PAULA MUSICH
Senior Editor

CHELMSFORD, Mass. — Apollo Computer, Inc. recently unveiled a line of fiber-optic-compatible network servers and technical workstations said to be the first complete product line that meets the Department of Defense's Transient Electromagnetic Pulse Emanations Standard (TEMPEST).

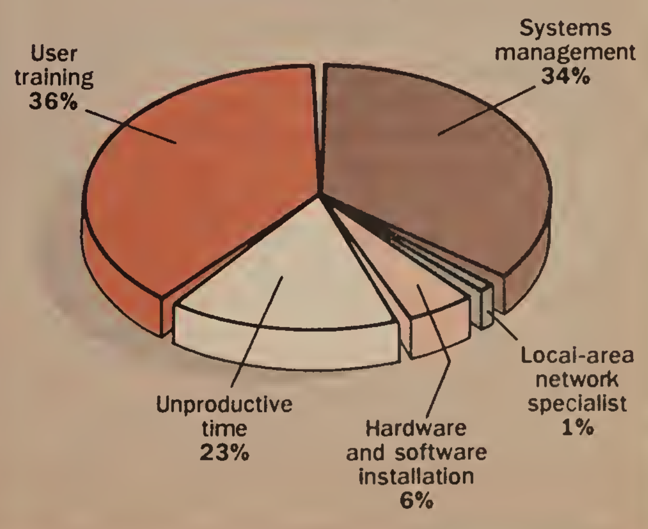
TEMPEST requirements define special hardware and safeguards to protect data from electronic surveillance. Some federal government requests for proposal demand that equipment comply with TEMPEST requirements.

Apollo's product offerings include the Domain TDSP90 and TDFS90 servers, TDN580 Turbo graphics workstation and Series 3000 (TDN3000) Personal Workstation. These are existing products that have been modified to the TEMPEST specification.

"Rather than just offering the federal government a single workstation product, our approach was to offer a range of cost/performance to satisfy the government's applications requirements," explained Roy Moffa, vice-president of Apollo's Federal Systems Division.

Use of fiber-optic cabling components, which will be compatible with those specified in the emerging Fiber Distributed Data Interface standard, is also a first for Apollo's token-ring Domain network. The network, which operates at 12M bit/sec, previously supported only coaxial

See page 16



The real cost of installing, using and maintaining personal computer networks

100 personal computers

Total three-year cost = $2,372,650

SOURCE: THE FERRIN CORP., SAN FRANCISCO

Network General smells success

continued from page 15

The Sniffer was introduced for analysis of the IBM Token-Ring Network, but Network General's strategy is to support a wide array of network types, Saal said. In March, the company announced support for Ethernet, followed in May by a joint agreement with Datapoint Corp. to develop a version of The Sniffer for that company's Arcnet. Although no formal announcement has been made, the company also plans to support Starlan, Saal said.

In addition to supporting the standard IBM protocol suite, including Network Basic I/O System, LU 6.2 and the Server-Message Block, Network General also supports protocol suites used by Novell, Inc. and 3Com. The Department of Defense Transmission Control Protocol/Internet Protocol and related protocols, Network File System from Sun Microsystems Inc. and mid-level OSI protocols are also supported. Pricing for The Sniffer ranges from $19,000 to $29,000, depending on the protocols supported by the system's configuration.

Network General's key competitors are Hewlett-Packard Co. and Excelan, Inc. However, both HP's 4971S and Excelan's LANalyzer EX 5000E analyzers are designed to work only with Ethernet networks. HP's system is offered as a packaged unit priced at approximately $27,500. Excelan offers a packaged unit, based on a Compaq Portable 286 computer, for $19,500, as well as a $9,500 board-level version that can be installed in an IBM Personal Computer XT, AT or compatible.

"The Sniffer is part of a huge business called network management," Saal said. "We're aware of the fact that we're only tackling a part of the problem. The Sniffer is for a very specific kind of a problem — taking a look at a local-area network, not a wide-area network."

Determining if there is a problem and what to do about it is up to the technician, Saal noted. "I think that's one of the disappointments for some people. They're looking for something totally automatic that's going to tell them that their network is broken, and maybe even tell them what to fix," Saal noted. "If we knew how to do that, we'd be shipping those products today."

Stahlman of Sanford C. Bernstein noted that the biggest market for The Sniffer is the end-user market. "The local-area network vendors have built network monitoring products of their own, but none of them are as rich in capabilities as The Sniffer," Stahlman said. "Right now, the product is a development tool. It will need to be repackaged to be sold into the end-user market — but that's the easy part." ◘

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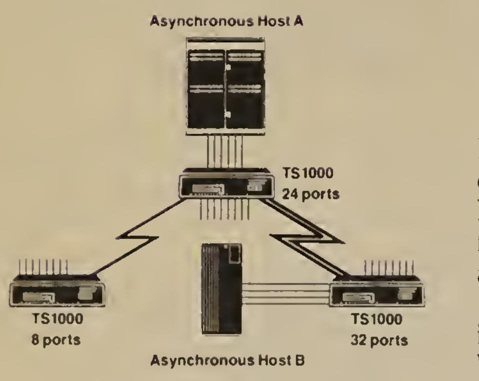

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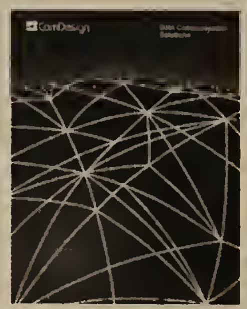

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Apollo unveils TEMPEST units

continued from page 15

cable. Fiber, which is nearly impossible to tap without detection, was chosen to provide emanation and transmission security.

Moffa said the TEMPEST line's networking functions are central to its performance. "In the TEMPEST environment, where you're working with a group of people in a secure environment, both the individual workstations and the physical transport — the interconnection method between the workstations — should be secure."

The TDSP90 network server acts as a communications and peripheral server. The TDFS90 is a dedicated file server and common storage server for multiple workstations.

"Much of the work that is done in government is related to sharing information and working in groups — particularly in areas where groups are redefined quite often," Moffa said. "What networking does is provide an environment which is very adaptable to changing mission requirements. If you look at major proposals in the past 18 months, they specifically call on networking as a way to share data bases and maintain control of information."

The TEMPEST line is available now. The Domain TDSP90 and TDFS90 servers cost $27,900 and $62,900, respectively. The TDN580 TURBO graphics workstation costs $66,900. The TDN3000 personal workstation is $29,200 for color or $21,400 for monochrome. ◘

Token-Ring gains acceptance

continued from page 15

local networks. But, outside of these two standards, there will be little room for other, proprietary offerings.

Networking products serving specialized, niche applications will survive on a smaller scale, but vendors hawking proprietary offerings that serve no special need will have to line up behind the Ethernet or Token-Ring standards, or perish.

A single, proprietary offering will no longer suffice. ◘

COMMUNICATIONS MANAGER

“You cannot provide enough training for users when you are putting in a new phone system. Set up specialized training sessions for top executives. Get direct support from the highest administrative level to ensure maximum attendance. When necessary, take the training to the users if that is the only way to reach all the people.

Michael Grunder
Director of telecommunications
Yale University

Solving users' network problems

Users can establish a network control center to manage network resources and increase the network's availability. A network control center can have a user help desk, a network operations group and a technical support group.

A user help desk can provide a point of contact where all network users can report problems. Its tasks include:

- Responding to network problems in friendly, nontechnical language
- Helping end users with procedures
- Answering questions on applications
- Tracking problems to their resolution
- Keeping a log of resolved problems on-line so that a second occurrence can be quickly resolved
- Performing first-level problem determination
- Routing complex problems to a network operations or technical support group

Network operations personnel manage and control the network and applications. This activity includes:

- Activating links, controllers and workstations
- Providing physical and logical connections to the application programs
- Performing second-level problem determination

The technical support group can consist of the organization's system programming staff. Their primary responsibilities are:

- Supporting the operation of network resources
- Understanding the applications, systems and common-carrier facilities
- Performing third-level problem determination

SOURCE: IBM, RESEARCH TRIANGLE PARK, RALEIGH, N.C.

DIALOGUE

How do you get the most from consultants?

“Generally speaking, I keep a tight rein on consultants and make specific requests, such as asking them for realistic time frames for finishing their projects. I'm a firm believer in giving them some rigid guidelines to work with before I turn them loose. Then they understand what is required of them and when it is required.

Guy Tomlinson
Director of corporate communications
Systems Development Corp.
Camarillo, Calif.

“We get the most by defining exactly what we want consultants to do for us and by staying on them until they finish the job. It's really a question of how much they put into the job. Picking the right one in the first place is very important.

Harry David
Manager of Information Systems Operations
Construction Equipment Business, a division of General Electric
Plainville, Conn.

“We have consultants who send out publications and updated information about vendors. We also attend their seminars. That's primarily how we use them — as information-gathering organizations to supply our technical people with information that they need.

John Hogan
Division Manager
Communications Service
U.S. House of Representatives

MANAGEMENT EDUCATION

Telecom goes to business school

MBA plan has communications concentration.

BY MICHAEL FAHEY
Senior Writer

SAN FRANCISCO — Anyone who needs further proof that communications is becoming an integral part of business management need only look to the University of San Francisco (USF), which in September will begin offering an MBA program focusing on communications.

The Jesuit university's McLaren College of Business is a traditional institution not normally given to experimenting with its curriculum. The school's administration, however, is convinced that communications has joined disciplines such as accounting, marketing and industrial relations as an important area of study for future executives and managers. Thus, administrators recently established an MBA program with a concentration in telecommunications.

"There are a lot of business schools that are quite market-driven," said Randy New, assistant dean at McLaren College of Business. "But other than a concentration in hospitality management, we have nothing that is nontraditional. In fact, the hospitality program is a natural because of all the hotels and restaurants in the Bay Area."

According to New, the USF program will differ from the telecommunications programs at most other colleges and universities in that the business school will offer it. USF's research showed that, by and large, the other colleges and universi-

See page 19

GUIDELINES

ERIC SCHMALL

Looks can be everything

A report may contain precise information and unassailable logic and yet be ignored, while a lesser quality but slicker looking document may survive senior decision-makers' criticism to win approval. The lesson is that form can be more important than content.

Communications managers, who make their living by riding the crests of technological waves, cannot afford to ignore the power of some formidable sister technologies: sophisticated print and graphics tools. As Marshall McLuhan proclaimed: "The medium is the message."

Communications protocols contain "presentation layers" in their upper strata, quite a distance from where the information bits flow. Communications professionals need to focus more on their departments' presentation layer in the creation of its reports, analyses, briefings and oral or written documentation.

For decades, simple business practice dictated that such finished products as reports, recommendations and studies had to be typewritten. The neater the copy, the more credibility the report gained. Word processors made reports look even sharper and more powerful: Margins could be automatically set, sections and paragraphs elegantly blocked, even misspellings electronically ferreted out of the final edition.

Now it is possible to make the next leap: personal computer- or host computer-based publishing. Now sophisticated fonts can be combined with typeset-quality graphics. Such documentation not only makes typewritten copy look sophomoric, it lends a new aura of believability to its content.

Similarly, an oral presentation accompanied by a smeary overhead transparency of a dreary typewritten page is not going to impress the director of information if he has already experienced animated, personal computer-based graphics on a large-screen video display. Personal computer-based graphics — which can not only summon up clear and imaginative symbols but can also make text appear, disappear, pop up, dissolve and dance across the screen — can make any audience sit up and take notice.

Selling communications technology requires showing some talent with related technologies. Communications managers have to, therefore, expand their competence horizontally in order to acquire some of these skills. They must encourage their analysts, technical writers and research technicians to pursue these skills as well. In order to promote and persuade, the modern manager must develop the capabilities of both Gutenberg and Spielberg.

Schmall is network systems manager for an insurance holding company.

▶ *NETWORK ARCHITECTURE*

Networks must consolidate

BY MICHAEL FAHEY
Senior Writer

CAMBRIDGE, Mass. — Fortune 1,000 companies must link their disparate communications operations and bring local- and wide-area voice and data networks into single, integrated corporatewide communications architectures, according to a study recently released by Forrester Research, Inc. here.

The report found that Fortune 1,000 companies currently have, on average, 13 separate wide-area networks and hundreds of remote local-area networks. These many separate networks restrict the flow of information within organizations, according to George Colony, president of Forrester Research.

Instituting a corporate network architecture and creating a central communications utility will break down the information bottlenecks that result from having many "islands of communications," Colony said.

The challenge for managers in developing a corporate communications architecture will be to take time from solving day-to-day network problems.

The challenge for communications managers in developing a corporate communications architecture will be to take time from solving day-to-day network problems to formulate a corporatewide communications strategy.

"There will be a need for an information czar who is familiar with all aspects of networking," according to Colony. That person's task will be to bring together local networks, private branch exchanges and wide-area voice and data networks to form one corporate communications network.

Standard network protocols such as Integrated Services Digital Network, Open Systems Interconnect and X.25 will be the glue that holds these integrated networks together, according to the report.

Colony said communications managers must show upper management that an integrated communications network will be cost-effective and that it can be put to strategic advantage in advancing the company's business plan.

"The communications manager must convince management that the corporate network will be a cost-effective revenue producer," Colony said.

According to the report, the trend toward departmental computing is spurring the need for integrated corporate networks. Companies are beginning to use many mid-range computers that can communicate with one another on an equal basis.

This creates a need for more flexible networks with improved compatibility between network elements, Colony said.

The report, Colony said, is designed to help communications managers begin planning the move from their present disparate networks to more free-flowing corporate network utilities. It identifies the fastest growing elements of corporate networks and presents an architecture for building the integrated corporatewide network.

The report, which was part of Forrester Research's "Network Strategy and Bulletin," is available from Forrester Research, Harvard Square P.O. Box 1091, Cambridge Mass. 02238. ☑

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With Racal-Vadic's 9600 VP Dial-Up Modem.

Herman Melville would have loved it. With a 9600VP high-speed modem, he could have sent his *Moby Dick* manuscript–all 1.2 million characters–from his PC to his publisher in less than half an hour, error-free. With a 1200 bps modem, the same trip would have taken more than 2 ½ hours.

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No other dial-up modem performs like the 9600VP. It cruises at 9600 bps and precisely slows down and speeds up as line conditions vary. And the 9600VP's dependable high-speed error control only retransmits bad data blocks–and nothing else.

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So call Racal-Vadic today at **800-482-3427**, and ask for a free demonstration. Then see why thousands of 9600VPs are already out there moving fat files through the real world.

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RACAL
The Electronics Group

Telecom at B-school

continued from page 17

ties offering telecommunications programs did so as part of the engineering or mass media curricula.

"Telecommunications is a large industry in its own right, and it is an important part of all businesses," New said. "It makes sense to position the telecommunications program at the business school."

The program will include courses in telecommunications technology and applications, systems planning and management, and domestic and international telecommunications planning, New said.

"We are talking about a standard MBA program with a concentration in telecommunications," he said. "Students will take the standard marketing and accounting courses and do a four-course concentration in telecommunications."

"They need people with a knowledge of the important issues in communications."

The Telecommunications Management and Policy Program will be headed by Heather Hudson, an expert on the economic impact of telecommunications in business and social services.

Hudson, who holds a Ph.D in communications from Stanford University, is taking a leave of absence from the University of Texas, where she founded and directed a program in new communications technology.

The Vancouver native said she researched the demand for graduates of a program such as the one she will be heading at USF and was encouraged by the response from vendors, users and regulatory bodies.

"These organizations aren't looking for people who are experts in technology," she said. "They need people with a knowledge of the industry and of the important issues in communications."

The effects of divestiture and rapid changes in technology have created a need for people who understand economic and business principles and who are aware of the role communications can play in their organization's strategic planning, Hudson said.

Hudson cited banking as an industry in which communications and information technology have become very important. Further, she said, the banking community has a shortage of people trained in the ways that communications can be used to gain a competitive business advantage.

The Federal Communications Commission has re cently begun encouraging state public utility commissions to play a greater role in setting telecommunications policy. That has created a need within those agencies for graduates trained in business and telecommunications issues, Hudson said.

Hudson, who has worked for the Canadian and Alaskan governments, as well as the United Nations and the National Aeronautics and Space Administration, said the growth of international communications has created a need for people trained in that area.

The new program will offer lectures and seminars with industry and user company leaders as well as student internships with major users, regulators and vendors, Hudson said.

In addition to offering full- and part-time MBA programs with a concentration in telecommunications, USF will offer nondegree programs for people working within telecommunications as vendors or users, according to Hudson. She said a number of Bay Area businesses have expressed interest in enrolling employees in the USF telecommunications courses. ◻

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COST PER USER	8 User System	16 User System
TeleVideo PM/286	$1,257	$ 926
IBM Token Ring* Network	$2,058	$1,474
3Com 3Server3 System*	$1,942	$1,268
Novell* Server System	$2,119	$1,357

Prices are manufacturer list for comparable configurations with hard disk, tape drive, RAM memory, network interface boards and network operating system. Dedicated file server only. No workstation.

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NEW PRODUCTS AND SERVICES

See inside for:

▶Harris Corp.'s IBM-compatible terminal controller

▶Diagnostic Ethernet transceiver

▶IBM 3278-compatible autodialer

▶ *INTERNETWORKING*

Mitek gateway bridges TCP/IP, IBM worlds

BY JIM BROWN
New Products Editor

CARROLLTON, Texas — Mitek Systems Corp. recently introduced a gateway that enables Ethernet-attached computers running the Transmission Control Protocol/Internet Protocol to access IBM System/36 or System/38 applications.

The product is an extension of Mitek's SNA Network Server line, which enables Ethernet-based systems from Apollo Computer, Inc., Sun Microsystems, Inc., Digital Equipment Corp., Hewlett-Packard Co. and AT&T, as well as IBM Personal Computers, to access applications on IBM 370-class mainframes.

The SNA Network Server wraps 3270 data streams within TCP/IP data packets. An SNA Network Server installed on a System/36 or System/38 will unwrap that TCP/IP packet and convert the 3270 data stream to a 5250 data stream. The SNA Network Server appears to the System/36 and System/38 as an application providing 3270-type terminal emulation, file transfer and interfaces to IBM interactive 3270 applications and remote job entry applications.

Likewise, an IBM mainframe-attached server receives TCP/IP data packets from the System/36, System/38 or other vendors' systems, unwraps the TCP/IP packet and converts the data stream into 3270. The physical connection between the SNA Network Server installed on the System/36 or System/38 and the Ethernet is made over an RS-232, RS-422 or V.35 connection. The link operates at 56K or 64K bit/sec.

Mitek said the System/36 version of the server will contain software that supports TCP/IP file transfer. The FTP/6.2 package implements TCP/IP's standard File Transfer Protocol (FTP) and takes advantage of the System/36's support for IBM's LU 6.2 Advanced Program-to-Program Communications facilities to transfer files with other Ethernet-connected hosts.

Mitek also announced two new packages for existing SNA Network Servers. One enables terminals employing the TCP/IP Telnet remote terminal protocol to access an IBM mainframe. The other enables IBM mainframe-connected 3270 terminals to access other host systems attached to a TCP/IP-based Ethernet.

The mainframe-based Telnet Server package converts incoming TCP/IP Telnet remote terminal-emulation protocols to a 3270 data stream. When packaging a response to the inquiring terminal, Telnet Server converts the 3270 data stream to TCP/IP's Telnet protocols.

The other new package, the Telnet/FTP Client, runs under TSO and enables 3270-type terminals to link to non-IBM hosts connected to the TCP/IP Ethernet and transfer files. Mitek does not yet have a product to extend that function to System/36- or System/38-attached 5250-type terminals.

The SNA Network Server hardware and software needed to link the System/36 or System/38 to the Ethernet running TCP/IP is expected to cost between $15,000 and $20,000. The Telnet Server package will cost $5,000, while the Telnet/FTP Client package is priced at $8,000.

Mitek Systems is located at 2033 Chennault Drive, Suite 100, Carrollton, Texas 75006, or call (214) 490-4090.

▶ *ON-LINE BUSINESS SYSTEMS*

VTAM link speeds PC access

SAN FRANCISCO — On-Line Business Systems, Inc.'s (OBS) software division recently announced a new version of its microcomputer-to-mainframe link that allows IBM Personal Computers to access and transfer files with an IBM mainframe through VTAM.

The Excellink/Host-V package requires modules on the host and on the personal computer. The latest version speeds response times and quickens file transfers by linking directly to mainframe data through VTAM, rather than contending for CICS or TSO processing time.

The package provides a teleprocessing monitor running under VTAM that supports IBM's Binary Synchronous Communications and Synchronous Data Link Control. It also supports the Hayes Microcomputer Products, Inc. modem command set and a number of personal computer communications adapter boards.

After entering a password to access the host package, users may request files to be downloaded. A host-based utility then reformats text files and other sequential files from the IBM EBCDIC code set to ASCII. It will not, however, reformat data base file formats. A company spokesman said users need to acquire such a facility from other sources.

The host-based package also provides an interface to IBM's Job Entry Subsystem, which allows users to submit jobs, check on job status, retrieve processed batch files and purge completed tasks.

An optional Session Pass-thru utility allows users to slip from Excellink/Host-V applications to other CICS or TSO applications without having to log off and then back on to VTAM.

An optional macro-level Host Application Programming Language, which is similar to Basic and TSO's Command List, allows users to automate access to host utilities or file downloading and uploading functions.

The host Excellink/Host-V package and the software needed to support the first 25 personal computers are priced at $12,500.

On-Line Business Systems' software division is located at 115 Sansome St., San Francisco, Calif. 94104, or call (415) 391-9555.

▶ *PC ADD-ONS*

AST emulation boards tie IBM PS/2s, minis

BY JOY KALFOPULOS
Network World Staff

IRVINE, Calif. — AST Research, Inc. recently introduced terminal emulation boards for IBM's Personal System/2 that enable the new microcomputers to communicate with IBM System/3X minicomputers over twinaxial cable. The firm also released a family of print servers that let personal computers share printers.

Designed to support IBM's new Micro Channel architecture, the Enhanced 5251/11A and Enhanced 5251/11A Plus make the new Personal System/2 appear to System/34, System/36 or System/38 processors as IBM 5251 Model 11, 5291 or 5292 Model 1 terminals. The boards will also make printers designed to work with personal computers appear to the minicomputer hosts as if they are IBM 5219, 5224, 5225 or 5256 printers. The Enhanced 5251/11A Plus supports up to seven concurrent host sessions.

Employing an Intel Corp. 80186 microprocessor with 128K bytes of random-access memory, the boards are supplied with file transfer software and an Application Program Interface, which allows programmers to make personal computer applications work in conjunction with mainframe applications. The products will also support IBM's PC Support/36 and PC Support/38 software.

The boards require the use of a Personal System/2 Model 8550 or 8560 with 1M byte of RAM, at least one Micro Channel expansion slot and PC-DOS Version 3.3.

The Premium Connection print server allows up to eight personal computers to switch between up to four different printers, including laser printers, plotters and other serial or parallel printing devices. Available in three models, the print server supports RS-232 and RS-423 connections and uses an Intel Corp. 8088 microprocessor. It uses 512K bytes of RAM, which can be expanded to 2.5M bytes.

Each model is equipped to support four personal computers. An add-on card is used to expand the units to support eight personal computers. The units come standard with one serial and one parallel printer port and can be upgraded to support additional serial ports.

The Enhanced 5251/11A costs $895, and the 5251/11A Plus is priced at $995. The Premium Connection Model 1 costs $1,150, the Model 2 costs $1,495, and the Model 3 is priced at $1,995. A four-port expansion card for the Premium Connection costs $120, while a 2M-byte RAM expansion card costs $525. AST Research is located at 2121 Alton Ave., Irvine, Calif. 92714, or call (714) 863-1333.

First Look

Packs let IBM PC access, test, analyze X.25 networks

Emerging Technologies recently announced two new software products that allow an IBM Personal Computer to access, test and analyze an X.25 packet-switching network or devices attached to that network.

The **PCX.25 Software Development System (SDS)** allows users to assemble X.25 testing applications on the personal computer. The package features a packet layer driver that runs as an MS-DOS background application. It also supports a library of C language functions, which support Lattice, Inc. and Microsoft Corp. C compilers. Those functions allow programmers to develop upper layer protocol X.25 test applications. The package's decoded packet trace facility allows users to debug problems by providing access to packet layer variables and control driver activity.

The **PCX.25 MultiTermM** package allows the personal computer to emulate a packet assembler/disassembler and terminal. It allows a personal computer to establish multiple connections over an X.25 line. Compatible with the CCITT's X.3, X.28 and X.29 standards, the package also provides a Digital Equipment Corp. VT-100 terminal screen on the personal computer. It can also act as a remote X.25 application server, which allows network managers to downline load commands, utilities and test application programs for execution on a remote device.

Utilizing Western Digital Corp.'s PC-4025 personal computer communications board, the PCX.25 SDS driver costs $450, while the PCX.25 MultiTerm package costs $495. The C library costs $495.

Emerging Technologies, P.O. Box 1525, Mineola, N.Y. 11501, or call (516) 742-2375.

Harris introduces terminal controller

Harris Corp. recently introduced a terminal controller designed to link as many as eight terminals to its Challenger 3270 Communications System, which includes IBM-compatible terminal controllers, terminals and printers accessing remote IBM hosts.

The **H174-04 Controller** is designed for small, remote offices needing connection to a central host. The controller makes ASCII devices appear to the host as IBM 3278 terminals by converting incoming ASCII data streams to 3270 data streams. In addition, the H174-04 makes an ASCII printer appear to the host as an IBM 3287 printer.

The controller supports a separate ASCII printer port, which allows controller-attached ASCII terminal users to print screens locally. It also supports IBM's 3179-G graphic display format.

The controller comes standard with four terminal ports and one ASCII printer port. The H174-04 Controller can be expanded to eight terminal ports and three serial ASCII printer ports. Connections to the controller are made over direct coaxial cable links and dual-purpose connectors for direct connection to twisted-pair wiring systems.

It also provides software functions such as an enhanced status-line support, dual session support and on-line diagnostics through an RS-232 diagnostics port.

In an IBM Systems Network Architecture/Synchronous Data Link Control environment, the H174-04 Controller supports speeds up to 19.2K bit/sec. In an IBM Binary Synchronous Communications environment, it supports speeds up to 9.6K bit/sec.

The four-port H174-04 Controller costs $3,350.

Harris Corp., 16001 Dallas Pkwy., Dallas, Texas, 75248, or call (214) 386-2299.

Ethernet transceiver features diagnostics

American Photonics, Inc. introduced a new Ethernet transceiver that provides a suite of diagnostic capabilities.

The **RL3000** Ethernet transceiver connects to either thick Ethernet coaxial cable or thin-net coaxial cable to provide computing devices with access to Ethernet local-area networks complying with IEEE 802.3 and Ethernet Version 2.0 standards. In addition, the unit's front-panel indicators display diagnostic information that informs users if the transceiver is receiving Ethernet signals. It also provides activity indicators informing users whether the unit is sending or receiving Ethernet data packets, and it allows users to adjust the Ethernet heartbeat signal to ensure compatibility with the rest of the local net.

The RL3000 costs $250.

American Photonics, Inc., 71 Commerce Drive, Brookfield Center, Conn. 06805, or call (203) 775-8950.

How California uses T1 to put taxpayers ahead.

There's nothing taxpayers want from their state more than tax savings, and California uses its N.E.T. IDNX® network to do just that. With a projected savings of a million dollars a year, for starters.

How does the IDNX make it possible?

By integrating the State of California's large and complex digital voice network with a smaller but rapidly growing data network. By a dramatic compression of voice signals. And by superior network control that saves management time and improves network uptime.

"When we first started our pilot project with N.E.T., the whole idea was to see if these things could be done," said Jim Fralick, supervising engineer for the State of California. "It was clear the economies of scale were there. By being able to take spare bandwidth on T1 and fill it to meet other needs such as data, we're using T1 to its maximum and achieving the greatest economies possible."

Why the State of California relies on its N.E.T. network for disaster preparedness.

The State is particularly concerned about maintaining its communication capabilities at times of emergency.

The State's hybrid system offers greater reliability with options of both dedicated and public lines. The IDNX network's redundancy and self-healing capabilities greatly reduce chances of network failure. And in the event of failure, the IDNX provides rapid, channel-by-channel automatic alternate routing.

More efficient communications to 180 state agencies and college campuses.

The State of California is optimistic about providing its taxpayers with more efficient services statewide—all with further savings of tax dollars.

"Because of the IDNX's bandwidth utilization and the State-owned fiber, we're also looking at possibilities of video communications," says Fralick. "In fact, our network may help us meet future needs that we're not even aware of at this point."

With the IDNX, the State of California is saving taxpayer dollars. Preparing for emergencies. And improving the productivity of state agencies and campuses. The California taxpayer is winning.

IDNX is a registered trademark of Network Equipment Technologies

Fiber-optic Ethernet repeater introduced

Canoga-Perkins introduced a remote fiber-optic repeater that will transmit signals from one Ethernet local-area network segment to another located as far as 3,300 ft away.

The **Model 8802 Fiber-Optic Remote Repeater** features automatic or manual segmentation as well as front-panel LEDs that indicate whether the device is receiving or sending data packets, whether the carrier signal is present and whether there has been a packet collision. The device connects to IEEE 802.3 standard transceivers.

The Model 8802 retimes, amplifies and repeats all signals it receives from one Ethernet segment and sends them to the other. The device also monitors signal quality and transmits only when good quality signals are received.

The Model 8802 costs $1,300 per unit.

Canoga-Perkins, 21012 Lassen St., Chatsworth, Calif. 91311, or call (818) 718-6300.

Device autodials number from IBM 3278 screen

Tuck Electronics, Inc. recently introduced an autodialer unit that reads a telephone number from an IBM 3278 terminal screen and automatically dials it.

The **Model 1990 Auto-Dialer** is designed for use in financial institutions or credit collection agencies as well as in telemarketing and other industries where high-volume calling is done from terminals. Requiring no software or hardware modifications to the IBM 3270-type system, the unit links to either a 2500-type telephone or headset and taps into the coaxial link between the 3278 and an IBM 3274 terminal controller.

The unit then passively plucks the telephone number field from the 3270 data stream being sent to the terminal. It can either automatically dial that number or wait for the terminal operator to press a function key. The unit will then display the number being dialed and inform the terminal operator when the called party has picked up the call.

The Model 1900 costs $1,250.

Tuck Electronics, Inc., 330 Second St., New Cumberland, Pa. 17070, or call (800) 882-5275; in Pennsylvania, call (800) 882-8825.

Interface links IBM RT/PC to IBM System/3X minis

SST Data, Inc. introduced a version of its terminal-emulation software to support connection of an IBM RT Personal Computer to an IBM System/34, System/36 or System/38 minicomputer.

Handshake III 5251 also supports file transfers between the IBM RT Personal Computer and the IBM System/34, System/36 or System/38 over either a twinaxial cable or RS-232 connection. The new product features an interface unit supporting as many as seven IBM RT Personal Computers equipped with Handshake III 5251 software. IBM RT Personal Computers can contend for ports on the interface device and are required to enter proper passwords before gaining access to a port.

The software allows IBM RT Personal Computer users to choose between a standard 5251 keyboard layout or a customized keyboard layout. The software also supports a special function key that replicates logon procedures.

A single-port Handshake III 5251 costs $1,930, while a seven-port version sells for $4,735.

SST Data, Inc., 250 S. Main St., #201, Thiensville, Wis. 53092, or call (414) 242-3999.

Firm adds to protocol analyzer product line

Digitech Industries, Inc. introduced a new protocol analyzer reportedly capable of capturing data at speeds up to 256K bit/sec.

The **Model 530** is being positioned at the top of the firm's existing 500 series product line. The new unit collects data from transmission lines and either holds it in a random-access memory buffer or stores it to a disk. That data can then be analyzed to ensure there are no errors in transmission protocols.

The unit features an integral 9-in. color CRT, a 20M-byte hard disk and an optional 2M-byte dual-ported RAM data capture buffer. It supports interactive protocol testing at speeds as high as 72K bit/sec.

The device will test X.25, asynchronous, IBM's Systems Network Architecture and IBM's Binary Synchronous Communications protocols. It supports RS-232-C, RS-449, RS-422, RS-423, V.35 and X.21 interfaces as well as three programming languages, including C Language. It also supports the firm's Trigger Language and the Scenario Programming Facility.

The Model 530 pricing starts at $19,950.

Digitech Industries, Inc., 66 Grove St., Ridgefield, Conn. 06877, or call (203) 438-3731.

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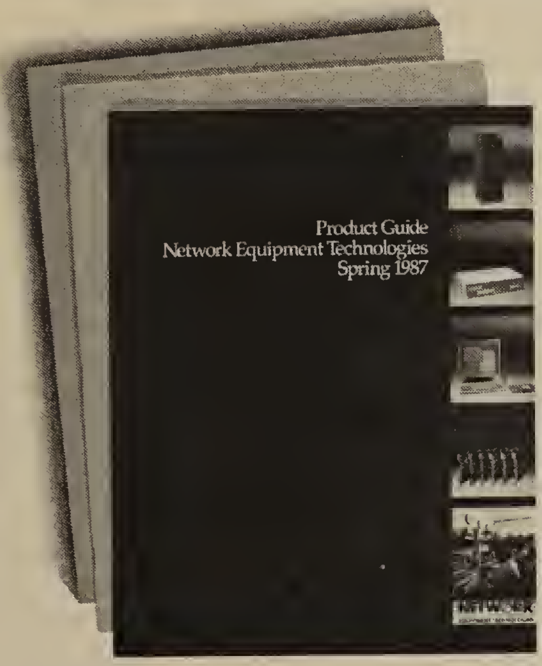

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NETWORK MANAGEMENT

JOHN KING

LANs are following WANs

What is network management? After reviewing documentation from several vendors of network management products, it's clear that the answer is similar to Rorschach test results: Network management is whatever someone says it is.

Before clarifying the concept for local networks, users must first examine the crazy quilt of network management for other types of networks.

For data networks, diagnostic tools used by network operators are the most obvious form of management products. These tools can be analog measurement units to test the quality of telephone circuits, or they can be protocol analyzers that examine bit streams. Many of these devices also count the characters or the blocks of data transmitted, along with the numbers of errors that have occurred over a period of time.

At a higher level, there are switches that allow circuits to be reconfigured, either to be plugged in to test equipment or to bypass other, failed circuits. Diagnostic equipment to identify modem and line problems is found at this level, also.

An even higher level of software keeps track of all components of the communications system, including their location, cost and parties to be called for service. There is also accounting software that allocates communications services or bills users directly for services used.

The highest level puts all of these functions into one hardware and software system. IBM's NetView is the best known of this type of system. Although NetView was originally cobbled together out of diverse parts, IBM intends to develop it into the kind of comprehensive management tool for which network customers are clamoring.

Now, what has this to do with local-area networks? A lot. The lengthy evolution of management tools for wide-area networks is being repeated in the local net environment.

Users are beginning to see a variety of devices designed to help network operators do for local networks what they can do for wide-area networks. The first wave of these new products allows operators to determine the quality of the signal on twisted pair, fiber-optics and other media. And users already have the initial protocol analyzers for local networks.

Because of their nature, local-area nets include a smaller number of devices than many wide-area networks. While this doesn't diminish the management task, it does make it easier than managing a huge, complicated international network. Also, the tendency to link local networks into larger networks is already evident. These local nets are often extensions to wide-area networks built around mainframe computers or clusters of minicomputers.

The result of all this will be local network management as an extension of wide-area network management capability. IBM is already doing this by allowing its Token-Ring Network management package to reside in the same Personal Computer as NetView/PC, which is simply a gateway into NetView for Systems Network Architecture nets.

Will this mean there will be no market for local net management products? Not at all. Just as there is already a wide variety of products that work with IBM SNA or with DECnet networks, there will be similar opportunities in the local network market.

Another trend is also clear, though. Network management, in all its various forms and functions, will become a highly centralized activity. Operators at a central site will be able to diagnose any type of fault in the network and dispatch the proper resource to fix the problem. The same operators will analyze traffic patterns and plan changes in the network design. And they will control the software that allocates charges or bills users groups.

In this environment, local net management will not be separated from other network functions. Therefore, it won't be surprising if vendors of local network management products quickly interface to wide-area networks through products similar to NetView/PC. Failing to do so allows IBM to use network management as the key to Token-Ring sales in SNA users organizations.

The bottom line is that there is no distinction between local-area and wide-area network management. No matter how complex or sophisticated the local network may become, corporate management will tend to view all networks as integrated resources. Managing the pieces is not enough. The challenge for vendors and the expectation of users is to put it all together.

King is an independent consultant based in Carmel, Calif.

IBM PS2 NETWORKING

PHILIP L. ARST

Resolution problems

With all the attention given to the "clone killing" aspects of the new IBM Personal System/2 series' graphics enhancements, users have taken little notice of its impact on data communications network requirements. The data communications interface options IBM offers with these products will bring a smorgasbord of interface and support capabilities to today's networks. These interfaces to today's conventional facilities support many major standards, and IBM has indicated its willingness to support others.

It's curious, however, that IBM announced Baseband PC LAN, a new, nonstandard 2M bit/sec baseband local area network that uses carrier-sense multiple access with collision detection, as its entry-level local net. Is IBM again playing the game of doing everything its own way, or is there a reason behind this? The answer is yes to both questions. Virtually all low-speed local networks (such as the 1M bit/sec Starlan) are inadequate to handle the new graphics capabilities of the high-end Personal System/2 models. IBM needed something better.

Two graphics boards, MCGA and VGA, are offered with the Personal System/2 series, with four levels of graphics representation supported. These new resolutions require from 307,000 to 1,224,000 bits to represent a full screen graphics display. By contrast, the IBM Personal Computer's full screen display of 1,920 characters uses only 15,360 bits to represent a full screen.

With Personal System/2 graphics, the total bits required to refresh the screen has grown 20 to 80 times the current message size, and the end is not yet in sight. A current IBM Personal Computer-compatible product, Princeton Graphics Systems' 3XX series monitor, requires approximately two million bits to refresh its monographics screen — a 100-fold increase in message size.

It is widely rumored that IBM is readying a 19-in. display, and Big Blue and the many aftermarket vendors may move up to the resolution quality established by Princeton. Add 10% to the above bit counts for communications overhead and users have a whole new ball game in data communications.

Fortunately for today's network manager, IBM's software is several years away. Although Apple Computer, Inc. has pioneered graphics and is making considerable inroads in business office markets, the widespread use of full-page graphics capabilities on IBM Personal Computers will take time and certainly won't replace many simple transaction applications. Nevertheless, new applications in scanned document and image retrieval are already in limited use, and, with the Personal System/2 and MacIntosh, those applications will move into the general market.

The IBM Baseband PC LAN now comes into perspective. The bandwidth required to transport such large screen refresh messages in bit-map mode provides a reason for abandoning proposed 1M bit/sec standards such as Starlan and going to the 2M bit/sec Baseband PC LAN for departmental applica-

Arst is president of Communication Strategies Associates, Inc., a data communications consulting firm in Cupertino, Calif.

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Contact Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700, ext. 732.

▶TELETOONS — By Phil Frank

Look, Chief.. I understand.. It's a natural thing to resist change... even in the communications industry..
Phil Frank

tions. But why didn't IBM go with thin-wire Ethernet, which, in contrast to the new IBM offering, is here now, works well, is installed by a large number of potential customers and is a worldwide standard? This is just another example of IBM doing something different to create its own de facto standard.

Possibly the most profound impact of the Personal System/2's sanctification of graphics is in wide-area networks. Today's terrestrial networks lack quick screen-refresh capabilities, except for expensive high-speed links between major plants. Certainly no cost-effective coverage of several hundred outlying branch offices is available at these bandwidths via terrestrial networks, and no rescue is in sight from a 64K bit/sec Integrated Services Digital Network.

Most wide-area networks in place or being designed today cannot adequately support these graphics. The best alternative right now is satellite networking via the new generation of interactive very small aperture terminals. These devices, when properly integrated into a network, can allocate the high bandwidth needed among hundreds of remote stations on a burst mode (such as packet) basis, thereby providing the performance needed for high-resolution graphics at an affordable price.

Much work is still needed to adapt today's VSATs to this graphics environment and to provide methods of integrating VSATs, T-1 services and other appropriate transmission services to solve the bit-mapped graphics transmission problem. Data compression techniques and the adoption of graphics definition language communications standards will offer some relief to these large message-size requirements — that is, if these graphics standards are followed by IBM and all the different IBM-compatible players.

For local-area network users who can't wait, Apple Computer is a good choice for graphics networking: It already has its graphics standards act together with its Appletalk network and PostScript graphics communications language. But if you intend to run graphics via the Personal System/2, now is the time to upgrade to high-capacity local nets or satellite networking, so as not to render networks installed today obsolete before they're fully operational. ◘

SYSTEM PLANNING

KATHRYN C. KOROSTOFF

Perspectives on purchasing

After 20 years of data communications equipment purchases, one might think that users would be higher on the learning curve for carrying out the procurement process effectively. Unfortunately, most users' procedures leave much room for improvement.

This is not to imply that purchasing is an easy task to face or that the task is ever taken lightly. It isn't. The decision to buy expensive equipment is a heavy responsibility, and there are many risks.

Weaknesses in the way the purchasing process is carried out make the task far more time-consuming and frustrating for both users and salespeople. Everyone in the industry has a different perspective on how to improve the process, and each has a valuable contribution to make. Consultants, lawyers, salespeople, users and other industry observers all have different opinions on which are the important buying issues.

Many consultants spend much of their time educating their clients. A large number of users, for example, don't fully understand the difference between vendors that sell stand-alone equipment and those that sell networking equipment.

Consultants also find that many users are interested in networking because it's a popular technology. These clients have difficulty determining what business problems could be solved by installing a network.

From a legal perspective, whether buying networks or other equipment, users are often oblivious to legal issues surrounding a purchase decision. They are often unaware of their own rights or the vendor's rights under the law.

Users should be aware of various items that may be in vendor contracts. For example, while the user has the right to reject equipment that does not conform to specifications, the vendor might also have the right to correct the situation. Such procedures should be clearly specified in the contract.

Potential disclaimers regarding product features is another point to consider. For example, data throughput is an important feature in networks; speed is essential for some applications. While throughput may be specified in product literature, users should be certain that it is also specified in a warranty or in the contract. If the speed doesn't meet specifications once the network is installed, the user could be stuck.

Salespeople often find that users don't realize how long and complicated a process network purchase and installation can be, whether it's a local-area, T-1 or other data switching network.

System requirements must be determined, with or without the help of vendors. Then the user must decide what criteria to use to compare each product's strengths and weaknesses. For example, cost is always an important criterion. However, is it the initial cost, maintenance cost, potential long-term cost of adding capacity or a combination of these that users want to measure and evaluate?

Salespeople advise that one criterion to be used when evaluating networking products is ease of installation — and not just the initial installation. Over time, add-ons can prove expensive and time-consuming.

Users should also be careful to consider their long-range business plans when evaluating products. For example, is the business expected to grow substantially? Do they expect to move to a new building in the next five years or to hire a large number of people?

Finally, when possible, users should seek out the advice of a qualified, objective industry observer. Too often, users get caught up in product hype. It's easy to get excited about new technology. But, if the old technology works, why not use it? Users should be cautious about investing in new technology before it's proven.

Buying a network is more of a long-term commitment and investment than buying stand-alone data communications equipment, and the risks are greater. Once you buy a network, you're committed to it, so examine vendor service and support carefully. These considerations can be more important for network equipment selection than for any other type of equipment purchase. ◘

Korostoff is a senior market analyst with International Data Corp. in Framingham, Mass.

NETWORK WORLD

Features

June 22, 1987

Fiction

The Tolkien Ring Network

This short story, based on J.R.R. Tolkien's *Lord of the Rings*, takes a lighthearted look at the current state of affairs in the communications industry.

BY WILLIAM ROBINSON
Special to Network World

The gathering storm brought them together. Each had unanswered questions, though not all feared what they might hear. Many knew from what source the storm sprang, and though none were certain, some thought the storm heralded greatness, not destruction.

The House of Elrond was honored by the assemblage. Gandalf, greatest of wizards, Frodo and Bilbo the hobbits, Aragorn and Boromir representing the men, Gimli the dwarf and Legolas the elf were gathered around a great table, discussing the future of Micro Earth.

It had been many ages since all the folk of Micro Earth were in Rivendell at the same time. The dwarfs burrowed deep in the mountains, elves wandered the forests, men plowed the fields and hobbits ate. Each spoke their own tongue, and though they knew a common one, they had no reason to use it. Now the rising storm could change all that forever.

Will the Blue Lord dominate Micro Earth forever?

Gandalf looked at the young hobbit seated next to him. "Bring forth the Ring," he said. "It is time all knew its secret."

Frodo paused, as if some unseen force wished to keep the thing hidden from sight. Slowly, he reached into his pocket and drew forth the plain golden ring, heavy in his hand. Forged in the eternal fires of Mount Doom in ages past, the ring bore no mark, no sign of its Power, save a line of finely etched runes that only the wise could read.

Gandalf spoke in a tongue nearly forgotten, reading the ancient words: "One Ring to rule them, One Ring to find them, One Ring to bring them all and in the Darkness bind them."

The Elves present covered their ears and cried in anguish. Elrond spoke for all his people, saying, "Long ages have passed since the language of Sauron was spoken in this hall. Too well do we elves remember our battle against the power of the Blue Lord in the First Age."

"Indeed," Gandalf said. "Perhaps we should remind ourselves of that ancient struggle as we debate our course with the Ring of Power."

The bearded Wizard told the tale of the battle between Sauron and the folk of Mainframe Earth. He spoke of King Sperry the First, who ruled long and counted many people

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Robinson is assistant professor of economics and director of the Center for Business and Economic Research at the University of Nevada in Las Vegas.

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NETWORK WORLD
FCC ruling advances telco data networks

"...I'm looking for vendors who take a systems approach to networking. And I find them in *Network World...*"

Robert Stark is Manager of Network Operations for Litton Industries of Beverly Hills, California. He supervises the company's voice network analysts as well as those analysts who provide telecommunications consulting services to Litton divisions.

In this position, he is also charged with establishing specifications and making recommendations for the purchase of network communications equipment. And in order to carry out these responsibilities, Robert turns to *Network World.*

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but in the end could not collect the taxes. He told of the wizard Digital, whose followers wielded the powerful magic of VAX and PDP. Burroughs, the King of Banking, and Cyber, Lord of the 60-Bit Word, entered the tale with many others who fought beside them.

"When the battle was over," Gandalf concluded, "Sauron had not won, and yet he had not lost. While his enemies survived, he would dominate their destinies throughout the Age of Big Machines. All found niches in which they could survive and even prosper, yet none would ever mount a serious challenge to the great Power again."

Frodo listened intently, the Ring safely back in his pocket. The Age of Big Machines was fascinating, but he could scarcely see any connection between that great battle and the current crisis. At length, he turned to the aged Wizard and voiced that question.

Gandalf considered his reply for some time. "Your question has no easy answer," he said, stroking his beard. "The world has changed, and the power of the Blue Lord is not what it once was. Errors has he made, errors that may yet be his undoing. Yet he remains more powerful than any other, and his followers grow daily more numerous.

"The ring is the key. Back upon Sauron's finger, it could bind together the folk of Micro Earth, ending the separation that now marks our lives. Whether the change would be for good or ill, none can yet say.

"In the early years of Micro Earth, all was at peace. The young Fruit King of Cupertino ruled beside Commodore Pet, commander of the Navy, and CP/M of the Eight Bits. Youthful exuberance was everywhere, much volleyball was played at lunch, and many BMWs were driven. The Valley of Silicon seemed unconquerable, and the demand for Fruit unlimited.

"Far to the East, in a land known only as Armonk, Sauron had built a device of Power. He had seen the Fruit King prosper and grew ever more jealous. Sauron's Machine was greater than the creations of the Fruit King, and Sauron knew his many minions would eagerly seek its Power. He called upon his 500 greatest followers, the Most Fortune-ate, and quickly did the Machine become their standard.

"Loudly did Sauron profess his commitment to the wise God of Open Architecture. Though suspicions remained, wizards in the Valley of Silicon wrote many spells to add Power to the Machine. They devised new Card tricks and worshipped the God of Peripherals.

"The Fruit King's power waned, the Princess Lisa died a painful death, and his new fruit was thought less tasty than the old. His fields became full of Mice, and his screens lost their color.

"Yet the Valley itself shone as never before. Its people prospered and were happy. Sauron had limited their activities but had rewarded them well. They grew content to work on his engine and soon ceased to dream of creating engines of their own.

"Sauron's victory was not complete. The Fruit King did not die, though he came under the thumb of the Cola Lord. When Sauron brought forth the smaller Chiclets-powered Machine, the Fruit King, his Commodore and the wizard Atari destroyed it with little trouble. Sauron's mobile Machine suffered a similar fate at the hands of the Clone Lord Compaq.

"Sauron thinks too much in terms of Mainframe Earth, and has not adapted well to life in the Micro plain. The price of his Machine is too high for many, and the legend of his strength carries less weight than in ancient times."

Frodo fidgeted. Frodo yawned. Bilbo leaned over to his young friend and whispered, "He'll answer your question in the next week or so, don't worry."

Gimli spoke, interrupting Gandalf. "What you have told us so far only confirms what my people believe. Sauron has been good for Micro Earth. Surely, the existence of the Clone Lords and the continued power of the Fruit King show the benevolence of Sauron. He is no longer an evil Lord, facing destruction at the hands of the Gods of Antitrust."

Fire burned in Gandalf's eyes. "Have you heard nothing that I have said?" he asked the Dwarf, his voice full of anger. "Sauron battles from within. He has destroyed the spark of creativity. He leads, and others follow blindly."

The Dwarf stood his ground. "But what of the Clone Lords?" he insisted. Gandalf spoke now as a teacher to a well-meaning but misinformed pupil. "They make machines in the image of Sauron's. What independence does that show? Sauron could eliminate them with ease, were he to change the basic spell by which his Machine is driven. They survive by taxing their folk less, not by their wits. Nay, the fire of innovation burns not within them." He paused for effect. "And," he intoned, "you forget the Ring."

Boromir had stood at the mention of the Clone Lords. "Take care in thy criticism of the Clone Lords, Wizard," he said. "The Clones have saved us much, and their Machines are superior to those of the Blue Lord. Yea, though their innovation may be less, we gain by their presence. And you speak falsely when you declare that the Clones could be easily destroyed by Sauron. So long as the Great Spells of Lotus, WordStar and dBase may be cast on the Clone Machines, they can survive any assault by the Lord of Armonk.

> "The world has changed, and the power of the Blue Lord is not what it once was. Errors has he made, errors that may yet be his undoing. Yet he remains more powerful than any other."

"Indeed," Boromir continued, "it was the great error of Sauron to keep his taxes so high that the Clones could gather strength. Now, as weeds in his garden, they have strong roots that are difficult to remove. Sauron may even find a backlash on Mainframe Earth, as his 500 Most Fortune-ate followers discover that the three mystic Blue runes hold less magic than was thought." Boromir sat, satisfied of the truth in his words.

Gandalf's face was tense. Frodo looked puzzled, as did many of those assembled. Could it be that the Wizard was less wise than they had thought? Could his vision be failing him at so critical an hour? Or was it Boromir's human frailties that hid the truth from his eyes?

Aragorn turned to his friend, and spoke kindly. "There is much truth in what you say, Boromir of Gondor. Yet one flaw may crack a large stone. As time passes, the Machines become more and more powerful, and the wizards improve the spells that run them. If Sauron changed the Spells of BIOS, the Clones would suffer greatly.

"As new and mightier spells of Spreadsheet or Words appeared, the Clones would find their Machines rendered useless, their powers a shadow of the might they once possessed. And remember Gandalf's warning not to forget the Ring."

At the mention of the Ring, Frodo snapped back to attention. He felt its cold smoothness in his pocket and asked, "What of the Ring?"

Gandalf took this cue. "With the Ring fully in Sauron's power, every Machine on Micro Earth could be bound together. And the Machines of Micro Earth could be bound to those on Mainframe, Sauron's domain.

"Great wisdom has been promised to those who would join with him and the Ring: new visions yet unseen, new paths yet untraveled, new worlds open to explore. Above all, the Ring holds the promise of Power. The many Elves of Micro Earth could be linked together, able to share their spells and songs without delay, even over great distances.

"But the Ring excludes those who are not compatible with Sauron's plan; some spells work not on the Ring, and simple folk have been turned into Wraiths in the deadly embrace of the new Machine. The Gateways that open paths from Machine to Machine often fail, trapping the innocent in limbo between."

Once again, Boromir had heard enough. "Wizard," he cried, "every object has many sides, and you reveal but few. The Traders of Gondor can use the Ring to ease their way and lessen their costs. Great groups of Machines, linked together, will speed trade throughout Micro Earth and all will benefit. The Ring opens many doors, and Sauron gains nothing from our passage into most. He forged the Ring, but we can control its Power."

Legolas considered what Boromir had said. "I see no difference between the great Ring system you describe and the vast Machines that rule Mainframe Earth," he said. "The same problems may arise. A break in the link can disrupt many, not just one. Secrets can be pirated away down the dark passages. The system grows ever more complex, not like the simple

Continued on next page

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Machines we now use."

The elf continued, "There is no gain, only a further loss of the individuality that is slipping like sand through our fingers. A giant collection of simple Machines? Nay, I say that is a great waste. If many must speak, let them use the Machines of Mainframe. I dream of seeing our LAN lush with trees and Fruit, not bound with chains of wire."

Frodo was again confused. "I see the advantage for the Traders," he said, "but of what use is the Ring to simple folk who wish for nothing more than a warm home and a cold beer?"

Boromir answered, "Through the Power of the Ring, common folk will be able to bank without leaving their homes; they will have access to the Great Markets where stocks are traded, and the financial universe shall open before them. Travelers will be able to obtain rooms at inns, spare horses or berths on the Wind Ships from their dining rooms. Many will be their options."

Frodo, again confused, said, "But of what use is the Ring to simple folk who wish for nothing more than a warm home and a cold beer?"

Bilbo smiled sarcastically and whispered to Frodo, "Boromir thinks a commoner is someone with only one Mercedes."

Gandalf rose to his feet and spoke in his most commanding voice, "The time has come to stop this debate and decide our course of action. We may cast the Ring into the Cracks of Doom and destroy it, or wield it and face the consequences, good or ill."

Frodo spoke, "I will take the Ring to the South, toward Gondor and the Realm of Sauron. It is a long journey, and Destiny will decide our course."

Few of the folk around the table had expected such a statement from the quiet hobbit, but quickly they nodded in unspoken agreement: Frodo should lead them to the edge of Sauron's domain. Perhaps then the great forces of Destiny would act to show the way.

As Frodo and Bilbo walked down the stone path to the small room they shared, the elder hobbit looked at his friend and asked him why he had chosen this way to travel.

Frodo walked on in silence for a moment, as if concerned only with not tripping over cracks in the stones. "I know that the Traders can use the Ring to great advantage, and all of Micro Earth will be enriched," he said. "I fear that Gandalf and Legolas are also right, that creativity and innovation are curtailed by Sauron's scheme.

"Though no one mentioned it, I believe that fewer new and unusual spells will be written if the Ring becomes the way of things and people look to share one great spell, rather than buying their own. I have yet to see any advantage for the common folk, but the natural curiosity of men may bring forth some unknown and useful task. Most of all, I feel in my bones that the Ring will come to be used and thought of differently than anyone now suspects.

Perhaps neatness should be brought into the chaos.

"I will go toward Sauron and the Cracks and hope that along the way I am given a sign to follow. The Ring tempts me. It cries out to be worn and used. Another voice inside me wishes I had never heard of Sauron or his Ring. I may destroy it, or I may give it to Sauron and help him wield it. I only fear that I will have to choose before I know which course is right."

The two hobbits continued down the path without speaking, both knowing that further words were unnecessary. The greatest minds on Micro Earth had been gathered around that table, and Bilbo saw that Frodo had the farthest reaching vision of all.

The histories of both Micro and Mainframe Earths were full of leaps into the unknown, some successful and some not. Perhaps, Bilbo thought, neatness and order should be brought into the chaos. Perhaps the Wizards should be made to try rational behavior just once.

The old hobbit laughed out loud. And perhaps they can teach a pig to sing. ▣

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PLEASE ANSWER ALL QUESTIONS, SIGN AND DATE THE CARD.

1 My primary areas of activity. (Circle ONE only)
I am involved in evaluating communications (data, voice and/or image) products and services:
1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both
4. Other (explain) ______________________

1a For communications, my primary responsibility is: (Circle ONE only)
1. Data Communications
2. Voice Communications
3. Both
4. Other (explain) ______________________

2 Circle only the ONE title classification which most applies to you.

Company Management
- 11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CEO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management

Data Communications
- 21. Management
  VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
- 22. Supervisory/Staff:
  Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services

Telecommunications
- 31. Management
  VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks, Engineering, Design, R&D, Application Development
- 32. Supervisory/Staff: Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services

Factory Communications
- 41. Management
- 42. Supervisory/Staff

MIS/Data Processing
- 51. Management
  VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
- 52. Supervisory/Staff: Supervisor, Head of Systems Design, Analysis Applications

Others
- 75. Consultant
- 80. Educator
- 85. Financial Analyst
- 90. Marketing/Sales
- 95. Other ______________________

3 Job Function
Which one of the following best describes your functional involvement with communications (data, voice, and /or video) products? (Circle ONE only)

Corporate
- 1. Business Management, Planning and/or Development

Communications System/Network
- 2. Management, Planning and/or Development
- 3. Implementation and/or Operation
- 4. Other ______________________

4 Which one of the following best describes the primary business activity of your organization at this location? (Circle ONE only)

Consultants
- 11. DP/Communications Consulting Services
- 12. Consulting Services (except DP/ Communications)

End Users
- 13. Manufacturer (other than computer/communications)
- 22. Finance/Banking/Insurance/Real Estate
- 23. Education
- 24. Medicine/Law
- 25. Wholesale/Retail Trade
- 26. Public Utility/Transportation
- 27. Mining/ Construction/ Petroleum Refining/ Agriculture/ Forestry
- 28. Business Services (excluding DP/Communications)
- 29. Government: Federal
- 30. Government: State/Local

Vendors
- 41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, International Records Carriers
- 42. Interconnect
- 43. Manufacturer Computer/Communications Equipment
- 44. Value Added Reseller (VAR), Systems House, Systems Integrator
- 45. Distributor
- 46. DP/Communications Services (excluding consulting)
- 95. Other ______________________

5 In which ways do you typically become involved in acquiring communication products (data, voice, and/or video) and services? (Circle ALL that apply)
1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 Check ALL that apply in columns A and B.
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

A B Product/Services

Computers
01. ☐ ☐ Micros
02. ☐ ☐ Minis
03. ☐ ☐ Mainframes
34. ☐ ☐ Printers

Data Communications
04. ☐ ☐ Communications Processors
05. ☐ ☐ Comm./Networks Software
06. ☐ ☐ Digital Switching Equipment
07. ☐ ☐ Facsimile
08. ☐ ☐ Modems
09. ☐ ☐ Multiplexers
10. ☐ ☐ Protocol Converters
11. ☐ ☐ Network Mgmt. & Control
12. ☐ ☐ Test Equipment
13. ☐ ☐ 3270 Controllers
35. ☐ ☐ Intelligent Terminals

Telecommunications
14. ☐ ☐ PBXs
15. ☐ ☐ Key Systems
16. ☐ ☐ Central Office Equipment
17. ☐ ☐ Integrated Voice/Data Terminals

A B Product/Services

Transmission/Network Services Equipment
18. ☐ ☐ Microwave
19. ☐ ☐ Satellite Earth Stations
20. ☐ ☐ Local Area Networks
21. ☐ ☐ Wide Area Networks
22. ☐ ☐ Packet Switching Equipment
23. ☐ ☐ Fiber Optic Equipment
36. ☐ ☐ T1

Communications Services
24. ☐ ☐ Packet Switching Services
25. ☐ ☐ Cellular Mobile Radio Services
26. ☐ ☐ Electronic Mail
27. ☐ ☐ Enhanced Services
28. ☐ ☐ Centrex
29. ☐ ☐ Long Haul Services
30. ☐ ☐ BOC Services
31. ☐ ☐ Independent Telco Services

Other
32. ☐ ☐ Factory Communications
33. ☐ ☐ Online Data Bases

7 Estimated value of communications systems, equipment and services:
A. which you helped specify, recommend or approve in *last* 12 months? (Check only ONE in column A.)
B. which you plan to specify,recommend or approve in *next* 12 months? (Check only ONE in column B.)

A B
1. ☐ ☐ $10 million and over
2. ☐ ☐ $5 million - $9.9 million
3. ☐ ☐ $1 million - $4.9 million
4. ☐ ☐ $500,000 - $999,999
5. ☐ ☐ $250,000 - $499,999

A B
6. ☐ ☐ $100,000 - $249,999
7. ☐ ☐ $50,000 - $99,999
8. ☐ ☐ Under $50,000
9. ☐ ☐ Don't Know

8 Estimated gross annual revenues for your entire company/institution:
(Circle ONE only)
1. Over $1 billion
2. $500 million to $1 billion
3. $100 million to $499.9 million
4. $50 million to $99.9 million
5. $10 million to $49.9 million
6. $5 million to $9.9 million
7. under $5 million

9 Estimated number of total employees at this location:
(Circle ONE only)
1. Over 5,000
2. 1,000 - 4,999
3. 500 - 999
4. 250 - 499
5. 100 - 249
6. 50 - 99
7. 20 - 49
8. 1 - 19

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Service Focus: Value-added network services

Lightning strikes twice

The FCC and the Baby Bells zap the VAN market.

Continued from page 1

switched services and some types of protocol conversion, but only within local access and transport areas. The Justice Department recommendations may pave the way for the BOCs to compete head-to-head with the VANs in offering inter-LATA packet-switched services.

The VANs suffered a second shock earlier this month when the Federal Communications Commission proposed levying access charges on VAN connections into local telephone company facilities. Currently, VANs can lease lines from local telephone companies and then connect their customers to those lines without paying local access charges, as the interexchange carriers are required to do.

Belitsos is president of Telematics Research, a San Francisco-based research and consulting firm. He is coauthor of Business Telematics *(Homewood, Ill.: Dow Jones-Irwin, 1986).*

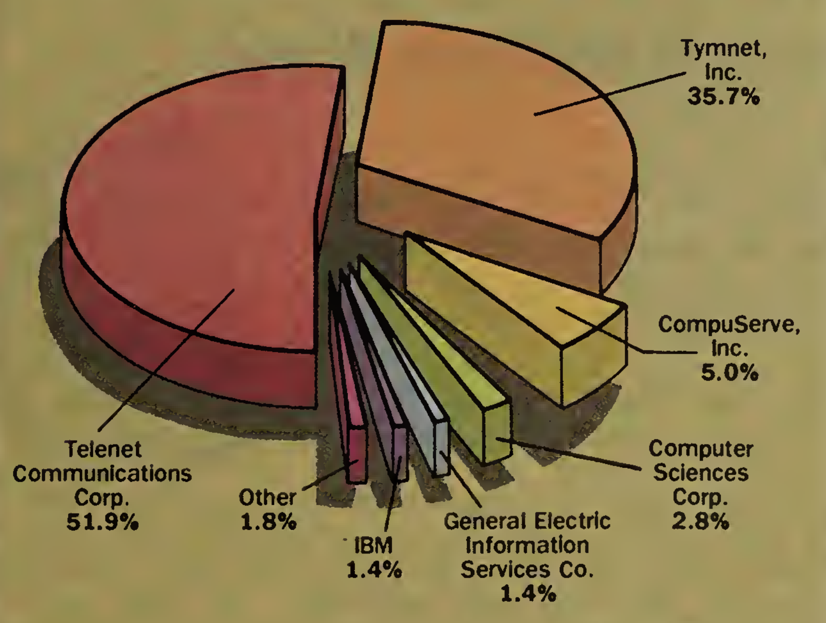
Under the new scheme, the VANs would pay an access fee of as much as $5 per hour for each customer they connect into local phone company facilities, and those costs would likely be passed along to users.

Since private packet nets would remain exempt from access charges, large users might find it much easier to justify the expense of building their own packet nets.

According to Kathryn Korostoff, senior market analyst at market research firm International Data Corp. (IDC) in Framingham, Mass., the VAN service industry had been expected to grow 18% in 1986 to $379 million. Actual revenues were $360 million last year, a 12% increase. New growth projections have been reduced to 10% per year during the next five years. However, Korostoff says that IDC is reassessing these projections in light of the FCC's proposal.

Value-added network service providers
by market share (1986 figures)

Total market = $359.5 million



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

"Users who have high enough monthly bills to consider buying their own equipment will be inclined to think twice about using these services. For large users of VAN services, an extra $5 per hour per user accessing the network is almost ridiculous," Korostoff says.

Trends take shape

Until now, VAN service vendors, the largest of which are Telenet Communications Corp. and Tymnet, Inc. (see chart on this page), have pursued two disparate strategies. The traditional direction, followed by vendors such as AT&T, Telenet and the BOCs, has been to concentrate on providing basic data transport and proto-

Continued on next page

From previous page

col conversion services for corporate networks. Other vendors, such as Tymnet, General Electric Information Services Co. (GEISCO) and IBM, tend to concentrate more on supplying vertical market applications.

Five years ago, most VAN services were packet-switching networks with asynchronous-to-X.25 protocol conversion. Today, most vendors support a wide array of protocols considered as basic services for an increasing number of applications. In the future, the industry's growth may depend on applications and services such as Electronic Data Interchange (EDI) and credit card verification, along with other point-of-sale transactions, data base services, electronic funds transfer, electronic mail and electronic software distribution.

"The value-added continuum is moving, and today's value-added feature is tomorrow's basic service," says Mark Winther, director of research for Link Resources Corp., a N.Y.-based research and consulting firm. The availability of low-cost data transmission alternatives, especially from the BOCs, is spurring the new application and service developments. "The future is bleak for those competing with the phone companies on the basis of low-cost connections alone," Winther adds. This is particularly true in light of the FCC proposal, which will make the cost of basic packet-switched transport expensive. Users may move away from pure packet-switched service providers in favor of vendors who offer specific vertical market applications which users cannot build into their own networks.

Also, new types of VAN customers are emerging, according to Victoria Marney-Petix, telecommunications industry analyst with Dataquest, Inc. "The MIS manager looking for low-speed, plain vanilla data transport has been pretty much satisfied by the VANs.

"A subsection of the current vendors and new market entrants such as the BOCs will be going after a new group of users who are looking for application-layer services. They have different needs and concerns from the traditional buyer," Marney-Petix says.

Private vs. public vs. hybrid

With customers such as the U.S. Department of Defense and MCI Communications Corp., BBN Communications Corp. is the largest provider of private packet net switching equipment, according to IDC. However, BBN doesn't have the field to itself. VANs such as Telenet, Tymnet and CompuServe, Inc. also manufacture, install and maintain packet-switching equipment for private networks. They also link these private systems to their public networks, creating hybrid networks for both intracompany and intercompany communications.

Most VAN vendors offer packet-switching services and X.25 protocol-conversion services on an unbundled basis. Users can employ packet assembler/disassemblers provided by the VAN (whether located on the user's or the VAN's premises) or they can buy their own PADs and then use only the VAN's packet-switching services.

> "The BOCs are going to be very price competitive. They're going to give all of the VANs trouble."

Large users have yet another choice. They can build their own packet nets by purchasing and deploying both packet switches and PADs, eliminating the need for third-party VAN services. This option will be significantly more attractive to users if the FCC's proposed access fees are imposed on the VANs.

The BOC initiative

While some VAN service vendors proclaim their future as data transport service providers, others express skepticism. "These data transport providers are making a lot of money today," says Link's Winther, "and the application providers are at a disadvantage in today's market. But the pure data transport companies are going to have a problem in the future. The winner in this market will be the low-cost provider, and that can only be the telephone companies."

Dataquest's Marney-Petix agrees. "The BOCs are going to be very price competitive. They're going to give all of the VANs trouble. It's just a question of how soon they can get their tariffs in place. Another 18 months will show what kind of market share they'll be able to grab."

The BOCs are optimistic about providing their new local packet network (LPN) services. "Because we don't have the overhead of a national network, users may find an economical solution in our network," says Joanna Olsen, a prod-

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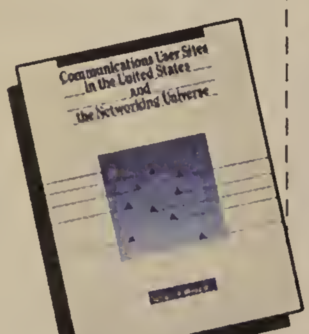

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An overview of value-added networks

Vendor/Network	Access type	Maximum line speed (bit/sec)	Value-added features	Protocols supported	Network type	Local dial availability	Gateways to foreign networks
AT&T Basking Ridge, N.J./ Accunet Packet Service	Dial-in via Redi-Access*; dedicated (point-to-point)	Dial — 2,400; dedicated — 56K	None	X.25	Data, terrestrial, satellite	100 U.S. cities	✓
ADP Ann Arbor, Mich./ Autonet	Public dial, private dial, dedicated (point-to-point)	Dial — 1,200; dedicated — 4.8K; private dial — 2,400	Electronic mail, dial backup	Asynchronous, X.25	Data, terrestrial, satellite	250 U.S. cities	✓
CNCP Telecommunications Toronto/ Infoswitch	Public dial, private dial, dedicated	Dial — 2,400; dedicated — 4.8K	None	Asynchronous, X.21, X.25, HDLC, SDLC	Data, terrestrial	102 Canadian cities	✓
CompuServe, Inc. Columbus, Ohio/ Network Services	Public dial, private dial, dedicated (point-to-point)	Dial — 2,400; dedicated — 14.4K	E-mail, dial backup, point-of-sale services, data base services	Asynchronous, X.25, BSC, MNP, SDLC	Data, terrestrial, satellite	312 U.S. cities	✓
Computer Sciences Corp. El Segundo, Calif./ Infonet	Public dial, dedicated (point-to-point)	Dial — 4.8K; dedicated — 14.4K	Dial backup, E-mail, data compression	Asynchronous, X.25, X780 HASP, 3270 BSC, 3270 SDLC, MNP, Minitel	Data, terrestrial	150 U.S. cities, 19 international cities	✓
General Electric Information Services Co. Rockville, Md./ Mark*Net	Public dial, private dial, dedicated (point-to-point)	Dial — 4.8K; dedicated — 19.2K	E-mail, dial backup, EDI, SNA Network Interconnect	Asynchronous, X.25, 3270 BSC, MNP, 3270 SDLC, 3770 SDLC	Data, terrestrial	600 U.S. cities; 4 international cities	✓
IBM Armonk, N.Y./ Information Network	Public dial, dedicated	Dial — 4.8K; dedicated 9.6K	EDI, information services, SNA Network Interconnect	Asynchronous, X.25 (overseas only), BSC, SDLC, X780 HASP	Data, terrestrial, satelite	226 U.S. cities	✓
Telecom Canada Ottawa/ Datapac	Public dial, private dial, dedicated	Dial — 2,400; dedicated — 19.2K	E-mail gateway service, data base access	Asynchronous, X.25, BSC, SDLC, ISO poll/select	Data, terrestrial	114 Canadian cities	✓
Telenet Communications Corp. Reston, Va./ Telenet	Public dial, private dial, dedicated (point-to-point)	Dial — 2,400; private dial — 9.6K; dedicated — 56K	E-mail, dial backup, point-of-sale services	Asynchronous, X.25, 3270 BSC, BSC, SDLC, MNP, X780 HASP	Data, terrestrial	400 U.S. cities	✓
Tymnet, Inc. San Jose, Calif./ Tymnet	Public dial, private dial, dedicated (point-to-point)	Dial — 2,400; dedicated — 56K	E-mail, facsimile, dial backup, point-of-sale services, dial-out service, data base services	Asynchronous, X.25, 3270 BSC, 3270 SDLC, SDLC, MNP, X.PC, X780 HASP, 2946	Data, terrestrial, satellite	650 U.S. cities	✓
Wang Laboratories, Inc. Lowell, Mass./ WangPac	Public dial, dedicated (point-to-point)	Dial — 2,400; dedicated — 9.6K	Dial backup, document conversion and storage system, application services, data base services	Asynchronous, X.25, BSC	Data, terrestrial, satellite	80 U.S. cities	✓
Western Union Corp. Saddle River, N.J./ Packet Switching Services	Public dial, private dial, dedicated	Dial — 2,400; private dial — 2,400; dedicated — 9.6K	E-mail, electronic funds transfer, point-of-sale services, data base services, Mailgram services	Asynchronous, X.25, X.PC, 3270 BSC, 3270 SDLC	Data, terrestrial	120 U.S. cities	✓

* Redi-Access is a shared packet assembler/disassembler service provided by AT&T and Control Data Corp.

SOURCE: *NETWORK WORLD*, DATAPRO RESEARCH CORP., DELRAN, N.J.

BSC	Binary Synchronous Communications
EDI	Electronic Data Interchange
HDLC	High-Level Data Link Control
ISO	International Standards Organization
MNP	Microcom Network Protocol
SDLC	Synchronous Data Link Control
SNA	Systems Network Architecture

uct manager for packet switching at Pacific Bell.

LPNs don't pose an immediate threat to the established VANs, however. Nationwide, only 15 states allow the local exchange carriers to provide public packet service, and this is usually limited to X.25 transmission and asynchronous-to-X.25 protocol conversion within the specific LATAs.

In addition, most BOCs are actively seeking permission to provide inter-LATA service through links to nationwide carriers. For example, Northwestern Bell has just received federal tariff approvals for an inter-LATA service via Western Union Corp. This venture will allow for uniform pricing across 14 states, according to Ron Dibelka, packet-switching product manager for the BOC. Dibelka says the BOC will file for IBM conversion this summer.

The pioneer LPN was Southern New England Telephone's ConnNet, which has X.75 gateways to Tymnet and Worldnet, ITT World Communications, Inc.'s (WORLDCOM) international packet-switched network (ITT has tentatively agreed to sell WORLDCOM to investor Bennet S. Lebow, who plans to merge the company with Western Union — "ITT sells WORLDCOM," *NW*, May 11.)

Cautious approach

VAN vendors dedicated to packet transport are approaching the LPN interconnection issue gingerly. They have many reasons to be careful, says Cathy Simon, regional product manager for packet switching at Ameritech. "Linking to us could mean loss of account control, loss of end-to-end network control and, ultimately, a loss of revenue. For example, we could do protocol conversion — a big money maker for the VANs — in the local net," she says.

"Because their VAN support rates are so much higher, users might be tempted to retain the gateway provided between the two networks but subscribe instead to our service. That's why some companies like Globenet are entering the market as providers of inter-LATA access," Simon explains. Ameritech expects to receive FCC approval for inter-LATA access by mid-summer and plans to file a synchronous-to-X.25 request in late 1987.

Tymnet has established connections to BOCs within five of the seven RBHCs , according to Clint DeGabrielle, vice-president of marketing and field operations for Tymnet.

Currently, Telenet offers no connections to the BOCs. "We are exploring the business feasibility of interconnection," says Telenet's Floyd Trogdon, vice-president and general manager of network services. "Our real desire would be that the local network be transparent to Telenet users, allowing us to continue to provide end-to-end service."

Link's Winther adds, "Telenet has made arrangements with Mountain Bell to collocate their equipment, but I don't see Telenet on the verge of doing deals all around the country to collocate their equipment. On the contrary, Telenet just announced a major program to expand its local access nodes, which means they are trying to get there before the phone companies have fully developed their local packet services.

"The VANs make their money in local access," Winther says. "That's why Telenet is deploying 100 new nodes: They want to control local access."

Tymnet and other VANs committed to providing both access and applications may have less to lose from linking to LPNs. "Tymnet was one of the first VANs to interface with a local packet network because they primarily want to be an application provider," Winther says. Tymnet's DeGabrielle adds, "I think the [telephone companies] will be both competitors and partners if both of us can approach the marketplace in a mature fashion."

However, despite its emphasis on network services, Tymnet hasn't implemented X.400. This could be a disadvantage for users looking specifically for electronic mail or other application-layer services, according to Walter Ulrich, a partner in Coopers and Lybrand's management consulting services division. "If everything else is equal, the edge goes to the vendor who is actively implementing X.400, and that's Telenet," Ulrich says.

GEISCO is also offering vertical applications in its Mark*Net network, which became commercially available in 1984. GEISCO initially offered traditional VAN services, but in 1985, the company announced a reorganization to drive its business into specific vertical market applications. The vendor is also aggressively selling EDI services, according to Vic Wheatman, senior consultant for Mountain View, Calif.-based market research firm Input. IBM's Information Network is a high-speed Systems Network Architecture-based network designed to offer applications and traditional remote processing services to heavy IBM users. Information Network is currently a small player among enhanced network providers, but it is key to IBM's communications strategy.

Providing EDI links is a high priority for Information Network marketers. Remote computing applications available include Professional Office System, Application System (an applications-oriented set of management support tools) and VM/AS for information centers and data processing departments. More than 200 IBM software products for data management and program development are available through Information Network.

Telenet, Tymnet and GEISCO have been aggressive in providing international connectivity, and Computer Sciences Corp.'s (CSC) Infonet has targeted the provision of international access as its primary business. CSC recently worked out a deal to offer CompuServe's videotex systems, news service, data bases and other services in Europe and the Far East. CSC also arranged late last year to interconnect Infonet with Brazil's Renpac packet network service.

Caveat for users

The value-added network market is moving toward sophisticated business applications in niche markets. Provision of basic services will become a competitive commodity market as the BOCs' local packet networks are tariffed and gain new customers. Users can expect better services, lower costs and a bewildering array of options in the future.

However, until a decision is made on the FCC's proposal to impose access charges on VAN providers, it may be unwise for users to enter into a long-term contractual commitment with a VAN. ◻

Program halted

continued from page 2

agement implemented the program heavily outweigh the positive benefits." The program's negatives, according to the PSD report, include fear, intimidation, mistrust, decreased productivity and loss of morale, all of which the report said are potentially damaging to Pacific Bell's capacity to provide service.

Pacific Bell executives disagreed with the PSD's conclusions, which they said are not supported by the report. According to a statement from the company, Pacific Bell has decided to "pause and assess its implementation of Leadership Development," but the company emphasized "the decision does not mean an end to the program."

In fact, Pacific Bell employees had more positive than negative responses to specific questions about the program. However, write-in responses about the program were overwhelmingly negative and included criticism of the program's use of intimidation and obscure language in its teaching methods.

The estimated cost of the program to Pacific Bell for 1987 is $40 million. In recommending a rate cut of $25 million, the PSD calculated the amount attributable to the program that appeared in rates for 1987; most of the cost goes toward the salaries of 500 Pacific Bell employees whose jobs are dedicated to the program.

The PSD report acknowledges that Pacific Bell has realized some benefits from the program. These include more productive meetings and improved participation by employees. "The training has created common culture with common words and common practices that cross the various disciplines of the company. This is necessary for partnering," said one employee, referring to the term for Pacific Bell's attempts to create cooperation across business units.

One of the PSD's most serious criticisms is that feedback on the program was discouraged. "Negative remarks regarding Leadership Development are very, very risky," noted one employee on a PSD questionnaire.

Another employee commented: "I believe there is a subtle pressure being applied. . .it becomes apparent that if you want to get ahead in the company, Leadership Development will be essential."

Yet another employee was more blunt in comments added to the questionnaire: "In our department, we were told we must attend if we want to keep our jobs."

Pacific Bell executives deny the program was mandatory. "It has been perceived as mandatory and used that way, and that's something we need to fix," said Carole Westphal, executive director of external affairs.

The Leadership Development program is a nontraditional management development program in part because of its use of "obscure and bizarre language," according to Royal Foote, a principal with Meridian Group in Berkeley, Calif. This management consulting group assisted PSD in its analysis of the Pacific Bell program.

"One other nontraditional aspect is people are actually forced to go to these meetings under threat of losing their jobs," Foote said. The PSD report notes that mandatory attendance was based on a management assumption that employees would resist change and therefore would not like the program until given sufficient time to "buy into" it.

Of 1,000 managers sent questionnaires about the program, nearly 500 completed the survey, Foote said. More than 60% of those who responded had negative things to say about Leadership Development in their write-in comments.

PSD's Thompson noted that the California PUC is pleased that Pacific Bell is suspending the program. "We support the company's objectives," Thompson said. "What we'll do now is wait and see what happens," he added.

Board provides multinet access

continued from page 2

dent and chief executive officer. Many large companies have users who want their personal computers to access multiple host environments as well as to be part of a local network, Carrico said.

Because the PCS/1 integrates local networking and host access capabilities and allows them to occur concurrently, users can move between environments without having to start up and close out applications, Carrico added.

The Personal Communications Server/1 (PCS/1) combines a sophisticated network interface board with software that can perform terminal emulation, file transfer and network management functions, as well as run network application software. Bridge provides much of this software, but the PCS/1 can also be used with a range of third-party emulation packages and gateway products. The product also supports Novell, Inc.'s Advanced Netware 286 and 3Com Corp.'s 3+ software, so PCS/1 users can access file servers running these operating systems.

Bridge offers Network Basic I/O System emulation as an option for the PCS/1. With NETBIOS, the PCS/1 can run networking software such as the IBM PC LAN Program and Torus Systems, Inc.'s Tapestry, as well as 3270 gateway products such as CXI, Inc.'s PCOX Gateway and Digital Communications Associates, Inc.'s IrmaLAN.

At the heart of the PCS/1 is the Intelligent LAN Adapter (ILANA). The ILANA is built around a Motorola 68000 microprocessor, and includes an Intel 82586 network coprocessor chip and 512K bytes of memory. The board's processors perform protocol processing, offloading the task from the user's personal computer. The ILANA's memory stores programs and provides communications buffers.

PCS/1 boards are currently available for IBM Personal Computer XTs, ATs and compatibles, as well as the IBM Personal System/2 Model 30. Bridge has announced it also plans to offer a micro channel version of the ILANA board for IBM's Personal System/2 sometime in 1988.

A basic PCS/1, which costs $1,195, consists of an ILANA board and bundled software. The software includes the Transmission Control Protocol/Internet Protocol and its applications Telnet and File Transfer Protocol, TTY terminal emulator for asynchronous communications, and Bridge's Network Management User Interface.

The net management interface can be used to monitor communications activities, such as the load on an Ethernet network, at individual personal computers. In addition, the Network Management User Interface can be used in conjunction with Bridge's Network Control Server/AT for more comprehensive network management capabilities, such as creating an audit trail of communications transactions.

PCS/1 software also includes the Bridge Application Program Interface (API), which allows third-party software developers to write terminal emulation, file transfer or other communications software that will work with the PCS/1. Bridge is making its API specification available free of charge.

A number of companies already are supporting the Bridge API, including Persoft, Inc., Walker Richer & Quinn, Inc., Softronics, Inc. and Grafpoint. Thus, a range of these companies' emulation packages will work with the PCS/1.

Bridge is also offering a variety of software options for the PCS/1. These include Bridge's NETBIOS emulation, VT52/VT100 terminal emulation and PC 3270/Emulation, each priced at $100. The PCS/1 is part of Bridge's strategy to provide personal computer connectivity in addition to terminal-to-host connections, Carrico said. Bridge has been supporting personal computers as terminals.

Big Blue ups NetView

continued from page 3

management software package. He predicted the IBM network management software will be enhanced so it can manage application software as well as operating system software.

The new release of NetView includes the ability to monitor PU 2.1 nodes for the first time, which is important in peer-to-peer networking environments. Because these nodes differ from traditional 3270 devices, IBM added new types of session awareness data to help an operator determine how well the node is operating.

A new release of NetView/PC, an extension of NetView that provides a gateway between NetView and other vendors' network management systems, was also announced.

The new release was designed to make it easier for other vendors to ship network management information to IBM host software. Vendors can now use a set of generic alerts to interact with IBM systems, instead of developing a distinct set of network management alerts.

Also, the net management software was enhanced so NetView could take a more active role in determining network problems. A service point command service enables a NetView operator to enter commands from a host and have them executed remotely.

An operator can, for example, initiate a diagnostic test that will be run by NetView/PC or the other vendor's network management system.

Sixteen new firms pledge support

Ellen M. Hancock, IBM vice-president and president of the company's Communication Products Division, said 16 additional companies have pledged to support NetView/PC, bringing the total number of followers to 25.

The new disciples include MCI Communications Corp., CMS, Inc., Racal-Milgo, Inc., Racal-Vadic, Inc., Emcom Corp., Paradyne Corp., Bytex Corp., Tesdata Systems, Inc., Doelz Networks, Inc., Applied System Technologies, Digital Communications Associates, Inc., Dynatech Data Systems, Telenex Corp., Avanti Communications Corp., Dynatech Communications, Inc. and BBN Communications Corp..

NetView was also added to IBM's Systems Application Architecture, a blueprint that enables customers and software developers to write applications that run on IBM 370, 3X and Personal Computer processors.

The one-time licensing charge for NetView Release 2 ranges from $9,020 to $60,250, and monthly fees start at $655 and end at $1,255.

9370 capabilities give new options

continued from page 3

the third quarter of next year.

NetView enhancements enable distributed and departmental 9370s to run unattended, controlled from a central site. Alerts can be sent from the remote site to a central operator, who may take corrective action.

IBM also announced a version of the network management software that runs under the VSE operating system. One-time prices for the distributed versions of NetView range from $9,020 to $31,440, and monthly licensing costs range from $655 to $950.

Michael H. Forster, group director for Mid-Range Systems Management at IBM's Information Systems Group, said volume shipments of the 9370 will begin next month. He said 180 processors have already been shipped.

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Talk is cheap with UNIS

continued from page 2

lines. It does this by establishing links between company facilities on an as-needed basis through the public dial-up telephone network.

The basic components of UNIS are four-port analog Customer Premise Modules (CPM), which can be used with private branch exchanges, key systems and Centrex service. When a caller keys in a colleague's extension, the CPM looks up the employee's actual telephone number and completes the call over the public switched network.

The CPM telephone number list is loaded from a data base maintained on an IBM Personal Computer or Unix-based workstation outfitted with Telelogic's Network Interface Management System (NIMS) software. NIMS downline loads configuration information to remote CPMs at 1,200 bit/sec. Each CPM can also transmit usage data and other network management information back to NIMS.

Echlin is testing UNIS to replace dedicated lines used to tie satellite company locations into an Electronic Tandem Network (ETN). The backbone of Echlin's ETN consists of two AT&T Dimension 2000 switches, one in Branford and one in McHenry, Ill., north of Chicago.

The ETN supports a seven-digit numbering scheme capable of routing calls between the two Dimensions and distributing calls to a variety of PBXs and key systems used at individual locations. Echlin's McHenry ETN switch serves 12 locations through 60 private lines, and the Branford switch supports six locations with 28 private lines. PBXs used include equipment from Mitel, Inc., Fujitsu Business Communications, Rolm Corp., Siemens Information Systems, Inc. and AT&T.

"UNIS is emulating what a private-line network with a uniform dialing plan would do," Wananaker said. The 88 private lines, he said, cost the company between $55,000 and $60,000 per month.

Wananaker said he is thinking about using UNIS to replace private lines serving three locations that have roughly 15 employees each. He may also install the system to reduce the number of private lines used to serve offices with as many as 500 employees.

"What I'm trying to do is look at this technology as a way to reduce my fixed costs. As long as my increased toll costs stay below my current fixed costs, I'm still saving money," Wananaker said.

He said the expected cost savings from UNIS would be enough to recover the hardware investment in about three to four months. "I spend so much money per month, it wouldn't take long to recoup what it costs to install the system," Wanañaker said.

Because UNIS is software-driven, Wananaker can take advantage of features not offered with ETNs. One of UNIS' features is call detail recording, which becomes an important function as the use of the switched network increases.

Another is UNIS' ability to let a caller retain a switched circuit to complete a series of calls to different parties. Without such a function, the caller would have to hang up the phone and reestablish new circuits each time a number is dialed, a costly practice since most phone rates are designed to charge more during the first minute of calls.

The UNIS system reportedly performs many of the same functions as carrier-provided virtual networks but without the need to link corporate offices to the vendor's switching center over leased lines.

"When you start looking at UNIS compared to the virtual nets AT&T, MCI or US Sprint have, you find one advantage is that you don't have any private-line costs to get to the vendor's point of presence," Wananaker said.

The drawback is that users will have to program and administer the UNIS system using the NIMS package, while the carriers would provide this service with their offerings, he said.

Wananaker's experience with the product has shown, however, that it is not difficult to administer once the system has been initially programmed. One of the few ongoing administrative tasks involves adding a new user or phone number to the NIMS data base. "If you're willing to manage any virtual network, UNIS is probably the best alternative," Wananaker said.

Another test site, Wang Laboratories, Inc., is using the product to divert unanswered calls at its Haverhill, Mass., facility through the dial-up network to a Wang Digital Voice Exchange (DVX) voice messaging system at its Lowell, Mass., headquarters.

Bob Uhl, Wang's director of corporate telecommunications, found that UNIS' ability to forward unanswered calls enabled more than 200 workers in the Haverhill facility to use excess capacity on the DVX system in Lowell.

Wang is also using the device to emulate a private-line voice link between Haverhill and Lowell.

"We're still exploring uses for this, and so far we've spun out a dozen or so. We think the box is pretty flexible," Uhl said. Since those other applications have not been fully developed, Uhl declined further comment on them.

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CALENDAR

June 23-24, New York — Packet-Switching Network Principles, Operation, Management and Applications. Contact: X.Concepts Limited, P.O. Box 6116, St. Charles, Mo. 63302.

June 24, Hartford, Conn. — Managing People. Also, June 24, Red Bank, N.J.; June 25, Princeton, N.J. and Springfield, Mass. Contact: Keye Productivity Center, P.O. Box 27-480, Kansas City, Mo. 64180.

June 24-26, San Francisco — Comptel Mid-year Seminar. Contact: Competitive Telecommunications Association, 120 Maryland Ave., N.E., Washington, D.C. 20002.

June 25, Tarrytown, N.Y. — Local-Area Networks: Future Directions. Contact: D.H. Brown Associates, Inc., Axe Castle, 400 Benedict Ave., Tarrytown, N.Y. 10591.

June 29-July 1, Napa, Calif. — Connectivity: Present and Future Directions. Contact: Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

June 29-July 1, Washington, D.C. — Voice/Data PBXs. Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

June 29-30, Chicago — AT&T Starlan Network Technical Overview. Contact: Registrar/Data Communications and Network Training, AT&T, P.O. Box 45038, Jacksonville, Fla. 32232.

June 29-July 1, Morristown, N.J. — Network Wiring Techniques. Also, July 15-17, San Francisco; Aug. 5-7, Boston. Contact: American Institute, 55 Main St., Madison, N.J. 07940.

June 29-July 1, New York — Hands-On Troubleshooting: Data Communications Systems and Networks. Also July 8-10, Washington, D.C. Contact: American Institute, 55 Main Street, Madison, N.J. 07940.

June 29-July 1, Detroit — Network Planning and Design with New Technology. Contact: Network Career Advancement Institute, Suite 113, 202 Fashion Lane, Tustin, Calif. 92680.

July 1-2, Somerset, N.J. — LAN Business Management Series: LAN Needs Analysis and Request for Proposal Creation. Contact: Technology Management Associates, Inc., 2767 Ridgemore Road, Atlanta, Ga. 30318.

July 7-8, Los Angeles — Introduction to Telecommunications Systems: Technologies and Applications. Contact: *Business Communications Review,* 950 York Road, Hinsdale, Ill. 60521.

▶ *PRODUCT REVIEW*

Choices for smaller systems

David Systems and Telenova offer users PBX, Centrex and data features.

BY JOHN J. HUNTER
Contributing Writer

Telecommunications managers in small businesses are in a quandary. Should these users with fewer than 300 telephone extensions purchase a large private branch exchange with multiple trunks and the ability to expand to thousands of lines, or is it smarter to go with units supporting a few hundred lines and a Centrex interface?

It's a tough decision, since many smaller companies are hesitant to buy future growth capabilities when the PBX may be obsolete in only a few years.

These users need sophisticated telephone facilities, such as call waiting, call forwarding, call conferencing, least-cost routing and automatic call answering with direct station connection. Many require the capability to switch asynchronous and synchronous data around their networks. Others want a PBX to provide services such as local-area networking to allow system resources to be shared.

David Systems, Inc. and Telenova, Inc. offer these users two alternatives: the David Systems Information Manager and the Telenova I. The Information Manager and Telenova I both have good telephone and call handling facilities. Both also support data and can link to a Centrex system or a PBX.

Two switching alternatives compared

	Vendor/Product	
	David Systems, Inc./ Sunnyvale, Calif. Information Manager	Telenova, Inc./ Los Gatos, Calif. Telenova 1
Total ports	384	255
Centrex interface	✓	✓
Price per port	$600 to $850*	$500 to $1,300

* Figures include David-Set telephones but no optional local-area network or IBM 3270 interfaces. SOURCE: TMS CORP., DEVON, PA.

David Systems and Telenova have taken different paths toward providing extensive telephone services to small users. The Information Manager is a termination device that offers on-premises switching and access to Centrex services or to a PBX. It also provides a foundation for local-area networks. The Telenova I is a traditional lower-end PBX that features Centrex-like services for smaller businesses.

The David system supports 24 Centrex trunks, while the Telenova handles 64.

The David system also furnishes interfaces for an Ethernet local network and permits IBM 3270 devices to connect to IBM cluster controllers through standard twisted-pair telephone wires.

David's marketing strategy for the Information Manager is clear. Instead of concentrating on providing telephone services, it is addressing companies' data sharing needs. This is done by providing an Ethernet local net facility running on conventional twisted-pair telephone lines, as well as the aforementioned IBM 3270 facilities. The vendor's Ethernet facility, however, is not IEEE 802.3 compliant. Each terminal gets only 1M bit/sec for its data packet vs. 10M bit/sec with standard Ethernet.

No LAN interface support

The Telenova I doesn't support a local net interface, but the vendor claims that an AT&T Starlan-like local-area network can be supported. Unlike Starlan, which provides 1M bit/sec for each terminal's packet, the Telenova unit is limited to 19.2K bit/sec asynchronous.

Both systems employ telephones with internal coder/decoders and programmable function keys. The David system employs its function keys to access customer-specified Centrex services, while Telenova users must enter special codes to call Centrex. Both vendors' telephones also incorporate LCD displays showing items such as user prompts, dialed numbers and lengths of calls.

The two systems incorporate RS-232-C interfaces for data transmission. The David unit utilizes the telephone connections for local net and IBM 3270 interfacing.

The David and Telenova products will never beat large PBXs based on their data handling capabilities. Both units accommodate only asynchronous inputs at speeds up to 19.2K bit/sec.

Further, David and Telenova have been claiming for more than a year that a synchronous facility is imminent, but so far, neither has introduced one. This capability is becoming more important as digital Centrex service becomes more widely available.

Both products use the typical star configuration in which telephones, workstations and other equipment attach to a central controller via twisted-pair wire. The basic David controller supports 120 ports and is expandable to 384 nonblocked ports. Telenova's basic unit also supports 120 ports and can be expanded to 255 nonblocked ports by adding a separate controller module. The David unit carries digitized voice and data over a backplane at 10M bit/sec; the Telenova does the same at 18M bit/sec.

Both vendors support tandem switch connections to increase PBX data/voice handling capacity and to extend the geographic areas served. David offers a wider choice of transport media, supporting coaxial cable, fiber-optic cable and T-1 twisted-pair connections at distances of 100 ft, 1,550 ft and 2,000 mi. respectively. Transmission speeds for these media are 10M (coaxial), 4M (fiber) and 1.544M (T-1) bit/sec. Telenova supports only twisted-pair connections; speed and distance figures were not available.

David Systems and Telenova have taken different paths toward providing extensive telephone services to small users.

The installation of an Ethernet Cable Interface enables the David Information Manager to connect David local networks with other local networks. The David nets then function as nodes on a standard Ethernet network. The Information Manager has a 10M-byte bus that handles packet transfers between local networks.

David local nets connected on the Ethernet cable can be 4,500 ft apart; two Ethernet devices attached to the David net can be 8,500 ft apart.

User input

Mitsui Manufacturers Bank, Los Angeles, Calif., chose the David Information Manager primarily for its Centrex capabilities, according to Cecie Turner, assistant to the vice-president of telecommunications. The system has been in place for 15 months and now has 13 offices connected via Centrex. Currently used for approximately 1,000 voice lines, the system is not yet transmitting data.

The Centrex-David marriage seems to be running smoothly for Mitsui. "We like the versatility of the system," Turner says. "It allows us to change line functions and move users with a minimum of trouble." She adds that users have had no problems learning how to use the system.

J. Feuerson Systems, Inc. of Parsippany, N.J., installed its Telenova I system in October 1986. They currently have 31 stations on-line.

Each station is configured to provide the services needed by individual operators. At present, only half of the stations are used for data.

According to company President Jim Feuerson, Telenova was selected primarily because of its flexibility and ease of use.

"The telephone set can be programmed for multiple personalities that can be invoked with just two keystrokes," Feuerson states.

"Multiple personalities" means that each station has programmable function keys that can be individually programmed to suit the user's application.

"The menu shown on the [LCD] display tells us the key functions and prompts us through operations. It's so simple that our users didn't need vendor training," Feuerson says. His only complaint is about the 19.2K bit/sec transfer. When operating with a Wang Laboratories, Inc. VS, the terminal's refresh rate runs between two and three seconds, vs. almost instantaneous refresh for the same terminals connected via coaxial cable. Since the David System also transmits at 19.2K bit/sec, it probably would do no better, given the same environment and processing load.

Summing up

In summary, since the telephone call services rendered by the Telenova I and the David Information Manager teamed with Centrex are pretty much the same, the decision of which to choose comes down to price and control. Centrex services are on a par with what's available from modern PBXs, and they save users the expense of buying and maintaining a PBX. Centrex users do, however, give up in-house call management and total network control.

Since Telenova provides all current Centrex services and many others, the only reason for using Centrex and the David Information Manager would be for direct inward dialing and for linking geographically dispersed offices.

The prices shown for the David system do not reflect Centrex service costs, which can be hefty depending on the Bell operating company and the services used.

Centrex service prices are based on the number of access lines, the distance between the customer and the central office and special features used. Users at different geographic locations might also get hit with mileage charges when connecting to a central Centrex.

Some Centrex users may be tempted to reduce line costs by multiplexing. However, these users must be careful to include any costs associated with the purchase, installation and maintenance of multiplexers in their telephone system budgets. They may find that their specific needs — and budgets — could be better served with a PBX. ◻

Hunter is president of TMS Corp., a marketing management consulting firm in Devon, Pa.

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> John T. Hewitt, General Manager
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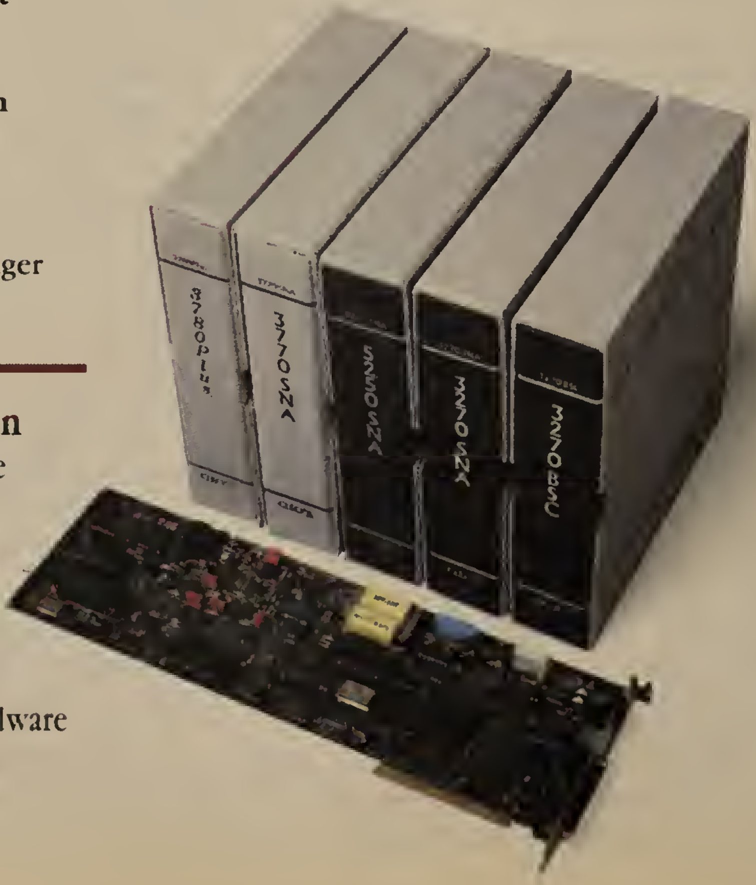

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